Digging for Common Ground

– Exploring how Practitioners of Alternative Farming Methods are replicating Principles of Traditional Ecological Knowledge

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Abstract

As a result of the harmful environmental practices found within the industrial agricultural system and the various negative accompanied socioeconomic consequences to health, local livelihoods, and resilience of rural communities, there has been an increasing global interest in Alternative Food Networks (AFNs) and alternative farming practices, such as permaculture and regenerative agriculture, that envision a more environment-friendly and equitable food- and agricultural system. At the same time, the potential of Indigenous woldviews and knowledges, such as Traditional Ecological Knowledge (TEK), to introduce more environment-friendly land use practices and to reshape our understanding of nature becomes more publicly, but also scientifically acknowledged in the management of natural resources. Yet, there is more need to examine how these knowledges may intersect with and influence practitioners' values within AFNs.

Therefore, this research examines the human-nature relationships of practitioners of alternative farming methods in Sweden by analysing their personal values and interactions with the natural world and explores to what extent participants are replicating and mobilising certain principles of TEK in their local contexts. The main findings demonstrate that participants mobilise various principles found within TEK, such as the understanding of ecosystem dynamics and the interdependencies and interrelationships between humans and non-human elements, the attempt to beneficially coexist with other species and elements found within their local ecosystems, and the desire to reconnect to local landscapes and recuperate traditional knowledges. The research agrees with studies in the current de-growth and embeddedness literature that have recognised the potential transformative power of a more holistic approach in addressing climate change and the various initiatives and grass-root movements that are guided by alternative approaches to sustainability. The study contributes to the existing literature by directly analysing the specific values and practices of practitioners of alternative farming methods and comparing them to TEK. In this way, the research is of direct importance to other researchers who want to further investigate the potential commonalities between Indigenous and Western land use practices and to initiate in particular action with regards to the relationships of humans to nature and a transformation of our current food system.

Keywords: Permaculture, Regenerative Agriculture, Traditional Ecological Knowledge, Agriculture, Global Food System, Rural Development

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1 Introduction

1.1 Problem Statement

With its focus on global competitiveness, economies of scale, monocultures, and synthetic fertilisers and pesticides, the industrial agricultural system devours vast amounts of fossil fuels and consumes water and topsoil at unsustainable rates (Kremen et al. 2012). It is at the heart of numerous forms of environmental degradation, including soil depletion, biodiversity loss, deforestation, air and water pollution, and the destruction of local ecosystems (Horrigan et al. 2002), and various socioeconomic consequences to health, local livelihoods, and resilience of food provision of natural ecosystems (McRae et al. 2016). The tendency of industrial agriculture to ever-expanding and more mechanised farms reinforces the concentration of production and exacerbates farm consolidation, which removes small producers and leads to the deterioration of rural communities (Horrigan et al. 2002). Admittedly, industrial agriculture has significantly increased crop yields through high-yielding plant varieties, mechanisation, and synthetic chemical inputs, and as a result, an enlarging range of people, in particular in the Global North, has enjoyed a greater variety and amounts of foods from all around the world at lower prices (McMichael 2013). However, the higher yields and lower prices have come at an immeasurable cost for the people who grow the food and the lands that are cultivated for its production, which are excluded in the food's real price. These factors may provide us, in the Global North, a false sense of guarantee that our food comes cheap, but it does not include the evidently damaging ecological consequences of large-scale industrial agriculture and the accompanied environmental and socioeconomic repercussions for local communities (Horrigan et al. 2002; Kremen et al. 2012; Pinna 2017).

In order to create a more equitable and sustainable food system, there has been an increasing global interest in various alternative forms of food production, distribution, and consumption, commonly referred to as Alternative Food Networks (AFNs) (O'Hara & Stagl 2001; Selfa & Qazi 2005; Watts et al. 2005). Although AFNs can be considered an umbrella term (Forssell & Lankoski 2015), all associated movements generally promote numerous forms of capitalist restructuring, ecological and political visions based on environmental awareness and progressive social goals, and a closer spatial, economic, and social proximity between producers and consumers (Renting et al. 2003; Higgins et al. 2008; Forssell & Lankoski 2015). It is argued that AFNs promote localised economies by "developing radical new conceptions of livelihood and economy that directly cut against the logic of growth-based capitalist economic strategies and elite conceptualisations of economic development" (North 2010:585). In this way, AFNs support a particular form of rural development (Pinna 2017) that focuses on a re-localisation of food (Watts et al. 2005; Higgins et al. 2008) in conjunction with

rediscovering and recovering traditional and more environment-friendly farming methods. This focus is supposed to have positive effects on the preservation of biodiversity, landscape conservation, regional and traditional food cultures, and rural livelihoods (Mailfert 2007; Schönhart et al. 2009; Wilbur 2013; Forssell & Lankoski 2015; Moroney 2016; Pinna 2017). In consideration of the inevitable challenges of climate change, including unstable food and water supply and vulnerable global economic infrastructures (Steffen et al. 2015), the creation of local and small-scale food systems is also driven by the desire to contribute to a greater resilience of food provision of natural ecosystems (North 2010). Practitioners within AFNs are commonly described to be locally rooted and guided by the desire to live more in balance with nature (Monllor i Rico & Fuller 2016). They promote alternative farming methods, such as permaculture and regenerative agriculture, which are closely aligned to their local environment and distinguished by a firm ecological conscience (Starr 2010; Ngo & Brklacich 2014).[1] Further, practitioners are described to be motivated by a new range of skills, education, creativity, and entrepreneurial drive to transform the agricultural sector and rural areas (Hamilton 2010), and commonly favour small-scale, ecological, diversified, biodynamic, and agroecological food production methods (Mailfert 2007; Monllor i Rico & Fuller 2016). Their principles are often characterised by affective factors towards the natural world, such as emotional affinity, empathy, and sympathy, and by political and economic aspirations that emphasise the possibility to combine ecological and social factors with economic benefits (Mailfert 2007; Wilbur 2013; Moroney 2016; Pinna 2017). What distinguishes most practitioners within AFNs is the meaning they connect to their specific way of life, in which "everyday life and 'the land' mutually constitute one another" – something that is "radical within contemporary society as the dominant tendency […] is towards a distancing of people from the soil" (Halfacree 2006:313). In this way, alternative practitioners often interact in reciprocal relationships with nature and attempt to cultivate an understanding that humans are not separate, but an integral part of it (Wilbur 2013). In Sweden, this new emergence of alternative practitioners is described as – "den nya gröna vågen" ("the new green wave") (Vlasov 2020:21). Their values depart from the prevailing discourse of the modern growth economy and encompass a different set of ideals that include a more grounded life, non-materialist conceptions of well-being, and a regenerative ethos reconnected with local ecosystems (Björklund et al. 2019; Schaffer et al. 2019). Also, the way these practitioners work, develop, nurture, and negotiate their physical, emotional, and spiritual connections to the natural world is a central element in the foundation of their livelihoods and enterprises (Halfacree 2006; Vlasov 2020).

[1] In this thesis, alternative farming methods are used interchangeably with regenerative agriculture and permaculture (see section 2 for further details).

At the same time, Indigenous worldviews and knowledges that previously have been ignored and aimed to be eradicated are slowly gaining momentum in the management of natural resources. Their potential to introduce more environment-friendly land use practices and to reshape our understanding of nature becomes more publicly, but also scientifically acknowledged with various international organisations recognising the potential of Indigenous biocultural knowledge for "adaptation strategies that are cost-effective, participatory and sustainable" (Aisher & Damodaran 2016:297). Further, there is a need for a more holistic paradigm that can deal with the increasing magnitude and complexity of climate change (Chapin et al. 2010) and that can contribute to place-based understandings of ecosystem relationships and its components (Mason et al. 2012). Inspired by Traditional Ecological Knowledge (TEK) of Indigenous peoples of North America, various studies have started to acknowledge the importance of a greater proximity to, and feelings of intimate personal connections with the natural world for the adoption of pro-environmental behaviour and sustainable land use practices (Whiteman & Cooper 2000; Shrivastava & Kennelly 2013). For example, a growing number of case studies, ranging from fisheries (King 2004), to wildlife (Berkes & Turner 2006), and forests (Trosper 2007; Emery et al. 2014) have demonstrated the contribution of TEK to more sustainable, productive, and locally accepted natural resource management (Bussey et al. 2016). Further, it is argued that a high degree of rootedness in the land strengthens ecological beliefs of respect, relationships of reciprocity and caretaking, and feelings of interconnection and interdependence with the natural world (Pierotti & Wildcat 2000; Whiteman & Cooper 2000; Mason et al. 2012; Hoagland 2017). Although the strong ethical ecological principles found within TEK have inspired various Western researchers and sustainability thinkers (Ingold 2002; Berkes 2008; Kimmerer 2013; Tree 2018), there is more need to examine how these principles influence practitioners within AFNs, and to explore their potential transformative character. "The ecological crisis is, after all, a relational one" (Vlasov 2019:3), meaning that it is a result of our increasing alienation to the natural world. In this way, the dominant agricultural system represents a symbolic relationship between human societies and nature, which is materialised in how humans organise and manage the natural world (Roux-Rosier et al. 2018). Moreover, agriculture significantly contributes to the human impact on the planetary boundaries and is simultaneously considerably affected by climate change (Howden et al. 2007; Rickards & Howden 2012). Therefore, in order to sufficiently address the current ecological crisis, it is intuitive that the current agricultural production methods and the global food system are one of the first sites to examine the human-nature relationships and to seek for a reorganisation of land use and food production (Godfray et al. 2010; Leclère et al. 2014). Hence, this study analyses and concentrates on different and alternative narratives. These accounts holistically explore the connectedness to the self, other living beings, and the whole

of nature (Steyaert & Hjorth 2006; Allen et al. 2019) in order to create value-driven knowledge that advocates for new ways of theorising, which can invigorate alternative pathways to create a better future (Cunliffe 2011). This thesis holds that practitioners of alternative farming methods mobilise certain elements of TEK. More, it argues that a further recognition of these knowledge- and management systems can help to restructure our agricultural system and global food sector. This can contribute to re-imagine our connection to nature with the ultimate goal to mitigate climate change and to build a more equitable and sustainable food system. Since our ecological crisis is in particular a relational one (Vlasov 2019), it is fundamental to examine practitioners subjective experiences, meanings, and perceptions to obtain a deeper understanding of their specific understandings and relatedness to nature. The purpose of this thesis is to provide a starting point to motivate for further research, and in particular action, with regards to the relationships of humans to nature and a transformation of our current food system.

1.2 Aim and Research Questions

The aim of this study is first, to examine the human-nature relationships of practitioners of alternative farming methods in Sweden by analysing their personal values and interactions with the natural world, and second, to explore to what extent participants are replicating and mobilising certain principles of TEK in their local contexts. In order to do so, the study attempts to understand how participants are engaging and defining their relationships with nature, and how these notions are reflected in their everyday practices. These insights are used to examine the extent to which participants mobilise certain principles of TEK. Thus, the following questions guide the research process and help to achieve the aim of the enquiry:

1. How do alternative farming methods share certain values (if they do) with TEK?
2. How are principles within TEK reflected and mobilised in the values and everyday practices of the chosen research participants?
3. What is the potential transformative character of a different understanding of nature for agricultural practices and the global food system?

1.3 Thesis Outline

This thesis is structured as follows: The second chapter presents a literature review and provides the theoretical foundation the study is built upon. It concentrates on permaculture, regenerative agriculture, and TEK and uses published scholarly articles, conceptual handbooks of practitioners, and grey literature. The third section introduces the methodological framework and provides a detailed

explanation of the chosen methods used for data collection, the selection of participants, ethical considerations, the researchers' role, data analysis procedures, and strategies for validating the findings. The subsequent chapter introduces the empirical findings of the conducted field study and demonstrates the main insights. The fifth section presents the analytical discussion and reveals the relationships between the major findings and TEK. The last chapter summarises and concludes by providing the main contribution of this study and by highlighting the necessity for further research and action.

2 Literature Review and Theoretical Framework

This chapter takes a closer look at the specific methods and guiding principles of permaculture, regenerative agriculture, and TEK. In this way, it specifically focuses on the first guiding research question and provides a literature review of published scholarly articles, conceptual handbooks of practitioners, and grey literature. It also functions as the theoretical foundation the study is built upon. Permaculture and regenerative agriculture are two prominent movements that overlap with and complement other initiatives found within AFNs, such as agroforestry, multifunctional agriculture, agroecology, and diversified farming systems (Kremen et al. 2012). Further, the selected participants are self-described practitioners of permaculture and regenerative agriculture. Therefore, this chapter specifically focuses on these two movements and commences by examining more closely their methods and practices, and guiding values and principles. The last section highlights some of key principles of TEK and demonstrates its practices, values, and specific characteristics.

2.1 Permaculture

Embedded within the broader movement of AFNs, permaculture is one prominent example that has developed as a direct response to the annual market-driven monoculture, energy-intensive procedures and production methods, and the harmful effects for the environment from conventional industrial agriculture (Suh 2014). The term permaculture is short for permanent agriculture, an ancestral and traditional agricultural practice that originates from the Far East.[2] Yet, the global permaculture movement emerged in the 1970s as a practical approach to collectively create sustainable human settlements (Beus & Dunlap 1990; Halfacree 2007), and to promote small-scale polycultures that depend on soft technology and renewable energy sources (Allen-Gil et al. 2009). Although permaculture practices have existed for thousands of years, it was Mollison and Holmgren (1978) who revitalised the value and significance of traditional permanent agriculture in the face of the global environmental crisis (Suh 2014).

[2] Permanent agriculture is said to have its origin from todays' China, Korea, and Japan (Suh 2014).

2.1.1 Concept and Definition

Permaculture is an agricultural practice linked to various social and environmental movements (Ferguson & Lovell 2014; Pant 2016). It focuses on a holistic regenerative design and sustainable practices for human settlements that are closely aligned to the local environment (Starr 2010; Ngo & Brklacich 2014). Practitioners attempt to find differentiated and context-specific solutions (Mannen et al. 2012) and promote a diverse set of methods and practices (Holmgren 2002), which are grounded upon localised experimentation (Mollison 1994). As a result, permaculture defies a narrow definition. However, in the words of its founders, it can be defined as "the conscious design and maintenance of agriculturally productive ecosystems, which have the diversity, stability, and resilience of natural ecosystems" (Mollison 1988:ix), or as "consciously designed landscapes which mimic the patterns and relationships found in nature, while yielding an abundance of food, fibre and energy for provision of local needs" (Holmgren 2002:xi). More, permaculture initiatives attempt to mobilise detailed knowledge about small-scale and locally-based production systems (Roux-Rosier et al. 2018). In general, it is described to provide a different form of agricultural production and overall vision, which attempts to re-imagine the human-nature relationships and to find innovate and more sustainable ways of co-inhabiting the earth with other natural beings (Gosling & Case 2013). According to Pickerill (2013:100), permaculture can be described as an "holistic, integrated practice that can build functioning sustainable alternatives that balance the needs of nature with the needs of humans".

2.1.2 Methods and Practices

Although permaculture defies a narrow definition, its organising methods and practices are guided by "its conscious attention to design, its mimicry of ecological patterns, its claim to yield usable resources at the local level, and its recuperation of traditional agro-ecological practices" (Roux-Rosier et al. 2018:561). In this vein, permaculture draws upon concepts such as pattern design and reading, the integration of local places, living systems and land use, and ideals of co-habitation and relationality (Mollison 1994; Lockyer & Veteto 2013). Its methods emphasise diversity and multifunctionality by concentrating on the use of perennial crops and polycultures, land use diversification, and whole-agroecosystem integrated water management (Ferguson & Lovell 2014). Diversification in multiple forms, both in production and a broader livelihood context, is a fundamental element within permaculture (Mollison 1988; Kinsella et al. 2000). More, permaculture is described to create a "dialogue between man […] and natural factors" (Mollison & Holmgren 1978:9) by building multi-species communities and systems that transcend human and non-human boundaries (Roux-Rosier et al. 2018). These systems are mainly constructed by humans and attempt to integrate human and non-human actors into a collective web of interconnected living systems (Mollison

1988; Holmgren 2002). Practitioners have a strong focus on local, practicable knowledge and understand permaculture as a toolbox consisting of scientific, empirical, and ethical elements. The scientific element mobilises conventional academic research from chemistry, agro-ecology, and other related fields in order to examine the chemical composition of the soil and to investigate the interactions between different local species. The empirical element further draws upon the interactions and attempts to understand the patterns, the interspecies relationships and habits, and the topography and local micro-climate. The ethical element constitutes the foundation and comprises the core values of permaculture that are guiding practitioners' understandings and decision-making procedures towards a respectful and environment-friendly land use. For example, areas are often classified into various zones, allowing different species to claim space and co-inhabit the area (Roux-Rosier et al. 2018). In this way, interspecies boundaries are created in order to form common, shared spaces, which function as contact points for various forms of interaction and exchanges of creative co-habitation (Mollison 1988). It is argued that these permeable and integrative boundaries support to reimagine the integration of humans with the natural world and create mutually beneficial interactions that support the life forms of a diverse community of species. In this way, permaculture strives towards a system design that allows a multitude of elements to co-inhabit and support each other (Roux-Rosier et al. 2018).

Managing a permaculture system requires practitioners to continuously observe and stabilise the ever-changing interactions and relationships between the elements within it (Mollison & Holmgren 1978). Hence, diseases and constraints to organisms within the system are interpreted as symptoms of design misconceptions, and thus, require an integration of stabilising elements (Roux-Rosier et al. 2018). An insight from the association of the corn-bean-squash triad (triad) is that each of the plants fulfils multiple purposes. Cultivated together, the triad functions as a source of food (e.g. for humans and pollen for bees), provides shelter for other organisms (e.g. mulch for worms that eat plant-damaging slugs), and nurtures the overall development of the association. The bean roots provide nitrogen for the other plants, the corn provides a supportive stem for the bean to grow and receive sunlight, and the squash leaves a sunshade over the ground, which helps to regulate soil humidity and complicates the growth of competing plants (Roux-Rosier et al. 2018). It is important to mention that the insights from the triad association are dating from long before and have been known by various Indigenous groups in North America (Kimmerer 2013). This is a good example that exemplifies how traditional knowledges have influenced or inspired the practices and values within permaculture.

2.1.3 Principles and Values

Although permaculture relies heavily on local practices and context-specific knowledge, all initiatives are seen to be connected under an integrated holistic vision (Dawson 2013) and combine various aspects from alternative agricultural practices, ecology, social justice, and alternative worldviews (Yusoff & Gabrys 2011). In this way, permaculture does not only focus on agricultural practices, but is also linked to various social and environmental movements that are advocating for the protection of the earth. As a result, permaculture writings and initiatives are relatively diverse in their scope and comprise the areas of land use practices, specific worldviews and philosophies that are motivated by visions of harmony and unity with nature, and forms of political resistance and emancipation against the dominating capitalistic and agricultural food system. Each of these initiatives provides a specific contribution to theory and practice and shapes the boundary between human and other natural beings in their environment. For example, the holistic worldview imaginary strives towards the integration of humans with the natural world by strengthening an attitude of mutuality and relationality to foster a caring relationship with the environment and to dissolve the notion of humans' separation from the natural world (Roux-Rosier et al. 2018). Linking permaculture to social movements of resistance, Rosa (2015) illustrates how a Brazilian permaculture initiave, Kilombo Permangola, combines sustainable agricultural practices with class- and race-based social justice movements. Further, Burke and Arjona (2013:235) demonstrate how various ecovillages in Colombia are creating "alternative political ecologies" opposed to capitalism as an organising principle and form of living. Such initiatives highlight permacultures' wider context linked to social justice movements, which attempt to create alternative social orders that include attention to both nature and marginalised social groups. In this way, boundaries (species, class, gender, ethnic) are described as reinforcing social injustice that need to be transcended (Pyhälä 2013).

2.1.3.1 Spirituality and Religion

According to Holmgren (2002:4), permaculture can be related to a certain form of spirituality, embodied in the vision of "caring the Earth" and referring to the planet as "our living all-powerful Mother". In a similar vein, the British Permaculture Association describes permaculture as "living lightly on the planet […] in harmony with nature" (Pickerill 2013:183). Although notions of harmony, spirituality, and integration represent fundamental elements in the ideological structure of permaculture, Anderson (2013:xiv) argues that spirituality mainly promotes a "reverent, respectful, caring, and responsible attitude toward the environment" rather than a religious element. However, some permaculture communities

explicitly draw upon religious discourses and emphasise cyclicality and rebirth.[3] For example, Birnbaum and Fox (2014) highlight that the Lama Foundation, a permaculture community in New Mexico, is strongly influenced by Native American land use practices and worldviews and various other religious heritages that are emphasising the interdependency of and multi-species interactions within nature and promote an understanding that all living organisms are related (Mollison & Holmgren 1978; Mollison 1988, 1994; Holmgren 2002). Parsons (2013:50) refers to spiritually guided practitioners to permaculture as "bioregionalists" that place a significant emphasis on transcendentalism and the down-to-earth, an imagined unity between the whole ecosystem and its parts, stressing that "they frequently look to the ecological wisdom, the values, the land ethic of the American Indians, living in Rousseau-like harmony with nature". Irrespective of the influence of Indigenous practices and worldviews within permaculture initiatives, the vision of living in harmony with nature may further strengthen the misconception of a romanticised understanding of many native interactions with the natural world (Roux-Rosier et al. 2018). Nevertheless, such imaginaries may support to envision a different relationship of humans with the natural world, for in particular non-Indigenous people, based on reciprocity, care-taking, and interdependence.

To summarise, permaculture reimagines boundaries as shared spaces of interaction and envisions a multi-species community that also includes the interests of non-human elements. Further, it attempts to limit the ecological footprint of humans, while at the same time recognising their responsibility towards the planet and the natural world. In this vein, humans are understood as agents of change that need to transcend their interests beyond the human. By closely observing and acknowledging the complex local dynamics of interspecies interactions, permaculture aims to strengthen the needs of humans without diminishing ecosystem vitality. It heavily relies on localised and context-specific knowledge and is influenced by certain spiritual elements that promote a different understanding of the relationships between humans and the natural world. The following section examines more in detail regenerative agriculture.

2.2 Regenerative Agriculture

Regenerative agriculture is another prominent movement that is found within AFNs. Many practitioners of regenerative agriculture argue that the agricultural practices that are currently labelled as sustainable, represent, in fact, only a modest improvement on the prevailing industrial agricultural methods. Hence, they only decelerate, but not avert, the rate of deterioration of the landscapes and ecosystems (Burgess et al. 2019; Petro & Haslett-Marroquín 2020; Schreefel 2020). Further,

[3] Some permaculture communities draw upon the tenet of Native American and Buddhist ecology that everything is connected to everything else, which also describes the mutual and reciprocal causal relationships between the various elements in an ecosystem (Suh 2014).

Rhodes (2017:103) claims that "all sustainable solutions are unsustainable over the longer term, if they are not also intrinsically regenerative". In this vein, the relentless effects of soil erosion, salinisation, desertification, and loss of carbon from the soil continue to exacerbate biodiversity, soil health, and mass extinction of species (Kremen et al. 2012; McRae et al. 2016). Hence, practitioners argue that it is fundamental to introduce more regenerative practices that completely redesign the agricultural system, and in particular its methods, in order to restore and revivify natural resources with support of natural ecological services (Jones 2003). Therefore, the specific focus of regenerative agriculture is the improvement and restoration of the highly degraded soil health, which simultaneously enhances the quality of water, vegetation, biodiversity, and land productivity. In contrast to other more sustainable agricultural practices, regenerative agriculture attempts to improve soil quality by minimising soil disturbance and losses from erosion, integrating amendments with a high carbon content, and preserving the biomass of roots and shoots. In this way, existing natural ecosystem services are enhanced and the natural resource base is increased, not only maintained (Rhodes 2017).

2.2.1 Concept and Definition

According to the Regenerative Agriculture Alliance (2020), regenerative agriculture is a combination of ancestral and traditional principles of Native communities in combination with modern science. It builds upon an Indigenous way of thinking in "seeing and working with the ecosystems on which life and its continued evolution depends, one where us humans are but one of those life forms". [4] In this way, the concept comprises more than just a set of agricultural practices that primarily focus on soil health and biodiversity, but rather includes a wholistic idea of regeneration. As a result of its large scope and range of activities, there are various understandings of regenerative agriculture (Elevitch et al. 2018; Newton et al. 2020; Schreefel 2020). For example, according to Soloviev and Landua (2016:5), regenerative agriculture cannot be confined to one single definition, since this "would put a wall around our agricultural landscapes […] and our minds, separating them from the natural world". Instead, they propose to deconstruct these walls by allowing each community and practitioner to interpret and generate the specific ecocultural meaning of regenerative agriculture that is unique to their local place, history and whole living ecosystem. However, they claim that regenerative agriculture is a multi-layered process of regeneration of the "health, vitality, and evolutionary capability of whole living systems" (2016:5). In this way,

[4] The Regenerative Agriculture Alliance (RAA) is an international multi-stakeholder initiative committed to regenerative agriculture comprising a community of industry leaders, farmers, public interest organisations, food sector businesses and cooperatives, tribes, and elected officials.

permaculture can be considered as a form within the broader term of regenerative agriculture. According to Jones (2003:2–3), regenerative agriculture utilises "natural ecological services to replenish and reactivate the resource base". Further, she asserts it "is productive and profitable. It instils a deep sense of personal satisfaction in farmers, rural communities and observers […] and rekindles our sense of self and our sense of place in the environment". On the other hand, other authors and organisations have emphasised the farming practices that enable regenerative outcomes, such as Toensmeier (2016) or The Carbon Underground (2017) that describes regenerative agriculture as "farming and grazing practices that, among other benefits, reverse climate change by rebuilding soil organic matter and restoring degraded soil biodiversity – resulting in both carbon drawdown and improving the water cycle".

2.2.1 Methods and Practices

In order to create a regenerative system, practitioners commence by evaluating the original ecological blueprint of a region, and from there, design a process in which outputs are generated while restoring the ecology of the local area (Petro & Haslett-Marroquín 2020). Further, the soil type, local ancestral knowledge, and the availability of resources are important factors that are taken into consideration (Schreefel 2020). As a result, regenerative land management requires the implementation of various local practices, which consequently produce different ecological services depending on the region (LaCanne & Lundgren 2018; Luján Soto et al. 2020; Newton et al. 2020). Generally, the methods applied within regenerative agriculture are similar to various other alternative farming movements and practices, such as permaculture, agroecology, or climate-smart agriculture (Burgess et al. 2019; Gosnell et al. 2019; Newton et al. 2020). Therefore, many regenerative agricultural practices that are applied by various movements are known under different names. Similar to climate-smart agriculture and carbon farming, regenerative agriculture attempts to reduce climate change and to sequester carbon in soils (Lal 2020) with "practices that have a wide spectrum for application with one goal: to regenerate the agricultural ecosystem" (Petro & Haslett-Marroquín 2020). Similar to permaculture, practices within regenerative agriculture are adapted to the specific local context of a region in order to sustain a just and healthy food system (Lal 2020). More, both share a holistic approach that transcends the area of farming practices and also includes environmental, economic, social, and especially spiritual components (Rhodes 2017; Burgess et al. 2019; Schreefel 2020; Giller et al. 2021). Both apply methods that include, for example, the preservation and creation of soil organic matter, minimum tillage, crop rotation, agroforestry, cultivation of cover crops and green manures, composting, and mulching while avoiding the use of artificial inputs (pesticides, fertilisers, herbicides) that are harmful to the living organisms in the soil (Rhodes 2012, 2017).

In this way, a regenerative system also attempts to adopt a similar system as agroecology, which provides improved soil health, carbon sequestration, enriched water cycles, and various other ecological benefits (Toensmeier 2016).

2.2.2 Principles and Values

As a result of its wholistic idea of regeneration, regenerative agriculture is guided by various principles that provide the foundation for practitioners' values and beliefs. First, it attempts to construct a fair system that balances the distribution of benefits and burdens equally for everyone by incorporating the ecological, economic, social, and spiritual elements central to its development. In this way, it adopts a holistic management that includes the interrelatedness of all elements involved in an ecosystem (Francis et al. 1986). Second, the system is structured to protect the ecology, including the genetic integrity of the plants and animals, the foundation of healthy social relations, and its resources in order to reduce the risks of social, economic, and ecological shocks. Third, regenerative agriculture focuses on a perennial system to preserve its ecology, economy, and social constitution on which it depends. Fourth, practitioners attempt to structure the system to be ecologically, socially, and economically accountable to all actors involved in order to guarantee a healthy working environment, economy, and ecology (Petro & Haslett-Marroquín 2020). Inspired by various Native communities, many practitioners are performing regenerative agriculture in order to restore traditional and locally-appropriate management systems, such as forests, wild animal routes, and social traditions. Hence, the values that are guiding their motivations relate little to market-driven and economic incentives, but rather focus on a reconnection to the local landscapes and social traditions (O'Hara & Stagl 2001; Watts et al. 2005). According to practitioners, a regenerative approach to agriculture, applied with integrity, is the only opportunity to truly change the harmful structures of the agricultural system that are degenerating the planet. In this way, regenerative agriculture can help to "recognise that the quality of our day to day lives is directly influenced by the quality of life in the soil […] when we can relate on a personal level to a world that is hidden from our view, but paradoxically always under our feet […] then, and only then, can we truly innovate" (Jones 2003:1).

To conclude, regenerative agriculture combines ancestral and traditional principles inspired by Native communities with modern science. It understands humans as an integral part of ecosystems and advocates for place-based understandings and practices. Hence, it requires the implementation of numerous local practices, which consequently result in various ecological services depending on the region. In this way, regenerative agriculture shares several practices and values with permaculture in emphasising the importance of local context and advocating for a holistic approach that transcends the area of farming practices and also includes environmental, economic, social, and especially spiritual components. More,

practitioners within both movements practice alternative farming methods in order to restore traditional and locally-appropriate management systems by focusing on a reconnection to the local landscapes and social traditions. The following section introduces TEK and functions as the main theoretical framework for the subsequent analytical section.

2.3 Traditional Ecological Knowledge

The following section provides a synthesis of some of the elements found within TEK that are represented in the literature. The chapter highlights some of its methods, practices, and specific values, in order to provide the ways in which TEK has been understood by various practitioners and scholars. This supports to answer the first guiding research question and also provides the foundation for the subsequent analysis of the second question. This section commences by providing an overview of TEKs concept and general understanding. Subsequently, it elaborates upon the guiding methods, values, and worldviews found within TEK. The specific principles constitute the foundation for the subsequent analysis and help to demonstrate how, and if, they are mobilised within the particular values and everyday actions of the participants of this study.

To begin with, as a result of its highly contextualised nature, the literature on TEK is very broad. Therefore, this study does not attempt to provide a complete review of the field, if such an effort were even possible. More, traditional ecological knowledge systems are diverse. Hence, this thesis does not claim to generalise across the various distinct values and understandings that are derived from the respective local places and contexts, which consequently result in a great diversity of ceremonial and symbolic expressions of ecological knowledges and traditional worldviews (Deloria 1990; Anderson 1996; Pierotti & Wildcat 2000). This diversity of local and traditional practices is also not explicitly reserved to Native and Indigenous communities and can also be found in other contexts and parts of the world. However, given the extensive amount of previous experience and research on sustainable land use practices with Native peoples of North America, this thesis focuses in particular on this body of literature and agrees that there may exist a shared meaning and understanding of the natural world, which has been coined as Traditional Ecological Knowledge (Pierotti & Wildcat 2000; Mason et al. 2012; Bussey et al. 2016). This focus does not maintain that TEK found in different contexts and places is inferior than the TEK derived from the North American context. Yet, given the limited scope and framework of this research, I focus on the various meanings and elements shared by Native communities of North America and scholars that have characterised those principles as TEK.

2.3.1 Concept and Definition

There is a great variety of definitions and a comprehensive terminology for TEK (Houde 2007). For example, Agrawal (1995:418) emphasises TEKs localness by arguing that this body of knowledge can be labelled as "local" or "Indigenous", since it is "embedded in its particular community, it is contextually bound, […] and it requires a commitment to the local context". More, Warren and Pinkston (1998:158), specifically use the term "Indigenous" to highlight that it refers to knowledge systems that are "unique to a particular community or ethnic group". For others, the expression "traditional knowledge" is more appropriate, since it highlights the ancient origin of this form of knowledge (Nickels 1999:8) and emphasises that knowledge is transmitted from generation to generation (Brant Castellano 2000). Similar to Houde (2007), this study uses the expression "Traditional Ecological Knowledge" in order to emphasise the connection of traditional knowledge to local ecological processes. One widely cited and expounded definition of TEK, guiding this research, has been provided by Berkes (1999:197), who asserts that "Traditional Ecological Knowledge is a cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment". Another similar definition, provided by Usher (2000:185), states that "TEK refers specifically to all types of knowledge about the environment derived from experience and traditions of a particular group of people". Concerning the scope of TEK, Berkes (2012) offers a conceptual model illustrating four interrelated layers of knowledge content. First, local knowledge of land and animals, concerning special characteristics and interspecies dynamics. Second, land and resource management systems that include human and non-human benefits. Third, social institutions, related to economic, ecological, social, spiritual, and governmental structures. Fourth, specific worldviews that consist of the values and beliefs regarding the role of humans in the world, and thus, representing the inseparable foundation on which TEK is built upon (Usher 2000). These layers have also been demonstrated and supported in other previous studies and are argued to have significant consequences for the methods and practices found within TEK (King 2004; Houde 2007; Medin et al. 2007; Ross et al. 2007; Reo & Whyte 2012).

2.3.2 Methods and Practices

According to Pierotti and Wildcat (2000:1335), TEK is based upon empirical observations of the patterns within the natural world and can be considered as "an intellectual foundation for an Indigenous theory and practice of politics and ethics, centred on natural places and connection to the natural world". It consists of the recognition, naming, and classification of specific elements of the local environment over a long period of time (Nickels 1999; Houde 2007), such as the

abundance of animals, facts about their behaviour and habitat, and anatomy of species (Huntington 1998; Brant Castellano 2000; Turner et al. 2000; Wenzel 2004; Reo & Whyte 2012). It is argued that practitioners attempt to understand the interrelationships among species, the connections within the biophysical environment, and the spatial distributions and historical trends of population patterns (Houde 2007). This allows to closely monitor the health of ecosystems and to measure local ecological changes (Ferguson & Messier 1997; Nickels 1999; Wenzel 1999). As a result, TEK is "as much about understanding the dynamics of ecosystems as about the description of their components" (Houde 2007:5). Further, Cajete (1994) describes it as a form of knowledge that draws upon all four aspects of being: mind, body, emotion, and spirit.

2.3.2.1 Strategies for the Use of Natural Resources

Within an ethical system based on TEK, the elements of the natural world are depicted to have their own reasons for existence, and hence, exist on their own terms independent of human interpretation. More, humans are required to learn that the non-human world is a part of their ecological and social community. This necessities humans to rearrange and adapt their everyday customs and behaviours in balance with the local ecological boundaries with regard to their use of natural resources (Deloria 1992; Anderson 1996; Pierotti & Wildcat 1997, 2000). Thus, practitioners implement various strategies for ensuring the sustainable use of local natural resources such as multiple cropping patterns, methods for estimating the state of resources, pest management, and resource conservation (Agrawal 1995; Ferguson & Messier 1997; Nickels 1999; Turner et al. 2000; Chapin et al. 2010). These strategies have been investigated in the North American context through various studies of management systems including wild egg collection (Hunn et al. 2003), controlled fires in the Yukon (Lewis 1989), and harvesting rotations in beaver trap-line systems (Feit 1978). For example, the historic use of fire on the landscape by Native Americans, and other Indigenous cultures, is a convincing demonstration of TEK in adaptive practice (Kimmerer & Lake 2001; Bilbao et al. 2010; Cogos et al. 2019). Fire plays a significant role in many Indigenous cultures' way of life, since it is connected to various cultural meanings and subsistence activities, such as crop management, growth and yield improvement, pest management, and control of resource access (Mason et al. 2012). Various scholars argue that Native peoples depended upon the non-human world for food, clothing, and shelter, and as result, developed a wholistic ecological management with strong ethical (religious) terms and concrete bonds between humans and the natural world that represent more than some romanticised union with nature (Rappaport 1971; Deloria 1990). Throughout the various Native American cultures, this is reflected in the intimate ties to the local land and the formation of specific social codes and institutions in the places that are called home (Anderson 1996). Hence, TEK

encompasses both a scientific and religious element, in the sense that the purpose of religion is to determine the relationships of humans with the natural world in order to obtain ecological knowledge and to sanction moral and ethical codes (Rappaport 1971; Deloria 1992). This is heavily influenced and embodied in local environmental knowledge and based on substantial insights into the dynamics of ecosystems (Pierotti & Wildcat 2000).

2.3.2.2 Generation of Knowledge

Various studies have emphasised the importance of local experience and direct observation in the generation of TEK (Cajete 1994; Pierotti & Wildcat 2000; Barnhardt & Oscar Kawagley 2005; Berkes & Turner 2006). Although insights within TEK are described as traditional, it does not mean that this body of knowledge is static. In contrast, TEK is a constantly evolving way of thinking about the world (Anderson 1996; Pierotti & Wildcat 2000). Since it is based on close empirical observations, practitioners are required to constantly adapt their activities and modify their responses to changing environmental circumstances. Hence, TEK is linked to long-term consequences of environmental change and human (inter)action with the natural world, which demands that each generation makes observations, compares their experiences with existing information, and tests the reliability of their knowledge (Fa et al. 2020). The reliance on new knowledge is one factor strengthening the importance and the focus on a spatial orientation within TEK. Consequently, this drives practitioners to recognise that there are always new experiences and that moral and ethical codes require to be adapted to current ecological and historical circumstances (Deloria 1992; Pierotti & Wildcat 2000).

2.3.2.3 Transfer of Knowledge

TEK also concentrates on practical experiences that are guided by spiritual beliefs, and transmitted through interpersonal teaching, traditions and cultural stories, and practice (Houde 2007). This type of knowledge is transferred from generation to generation via continuity of practice, oral histories, and interpersonal teachings (Deloria 1992; Barnhardt & Oscar Kawagley 2005; Houde 2007) that are closely integrated with strong ethical and spiritual elements (Murray et al. 2011). Therefore, TEK is specifically embodied in personal knowledge that is transmitted over generations through narratives. This provides a sense of intimacy that is deepened and validated through social life and the community (Cruikshank 1998; Usher 2000; Berkes 2012).

2.3.3 Principles and Values

Practitioners of TEK propose that nature does not exist independently of humans and their activities, and hence, humans are, and always will be, connected to the

natural world (Deloria 1990; Pierotti & Wildcat 1997). More, they argue that humans should not understand themselves as responsible for the management of nature (or as stewards of the natural world), but instead as a part of the same value and importance as any other in the world For example, the Western concept of management is not a traditional idea within TEK, since it can reinforce the anthropocentric attitude that humans are separated and apart from the natural world, and are able to control it to meet their respective needs. In contrast, the study of Mason et. al. (2012:190) reveals that tribal peoples understand the relationship between humans and the natural world as the following "The earth does not belong to us; we belong to the earth."[5] As a result, the respect for the non-human world is a fundamental principle within TEK, since all parts of the natural world, including animals, plants, and landscapes, are incorporated and extended into the ritual representation of the ecological community (Anderson 1996; Lyver et al. 2019).

2.3.3.1 Ecological Community

The inclusion of other living beings and natural objects as part of the wider ecological community is a fundamental principle that provides significant implications towards the value and the treatment of the natural world. Throughout many Native American cultures, there exists the belief that humans and non-humans are closely connected together and as part of one community, are performing reciprocal forms of empowerment and emotional interactions. Hence, practitioners recognise that humans and non-humans are reciprocally interdependent and that the activities of one part of that relationship are shaping the lives and ecology of the other. Further, various studies demonstrate that practitioners relate with predators (Tanner 1979; Brightman 1993; Marshall 1995). This results from the fact that they recognise that they must take lives in order to live themselves. Hence, they are aware of what it means to take the live of another individual (Tanner 1979). The relationship between humans and non-humans is more profound than most other people can understand, which often leads to the Western misconception to speak romantically of Native people's closeness or love of nature. Such a misunderstanding projects a rather sentimental and harmonious character to this relationship, but neglects the comprehensive amount of empirical knowledge of the dynamics of the natural world gathered by Native peoples (Anderson 1996; Pierotti & Wildcat 2000). Practitioners recognise that animals and plants existed before humans. For example, in Rock Cree cosmogony, humans are recognised to descent from animals during the evolution of the earth (Brightman 1993). Therefore, non-humans are understood as elders, who function as teachers and respected members of the community. This requires humans to pay careful attention to their lives and to recognise their value, which consequently establishes

[5] The involved tribe in this study was the Salish Kootenai located in western Montana, USA.

an ethical system based on proper treatment of the non-human elements (Pierotti & Wildcat 1997, 2000). This system results from having evolved in strong association with non-human elements, and interacting with them on an everyday basis. The ancient knowledge within TEK that humans and non-humans are related and irrevocably connected to the natural world, is an insight only less than 150 years old in Western thought, which has been demonstrated by Darwin's' evolutionary concept that humans must have evolved from non-human ancestors (Mayr 1997).

2.3.3.2 Traditional Ecological Knowledge and Western Ecological Concepts

A fundamental element that has shaped the formation of Native worldviews has been put forward by Deloria (1990:16–17), who asserts that the Native understanding of nature derives from the common history between humans and "the group of other forms of life which had come down over the centuries as part of the larger family". As many peoples have existed along other forms of life for thousands of years, Native peoples have developed their sense of place through careful observation of their constantly evolving environment and the changing dynamics of ecosystems. This observational knowledge has led to the major insight within TEK that all things are connected. This shall not be understood in any romanticised manner, but rather derives from the realisation that "no single organism can exist without the web of other life forms that surround it and make its existence possible" (Pierotti & Wildcat 2000:1336). This understanding is closely related to insights within Western community ecology, which highlight the interrelationships between different species, and describe these interactions by using a metaphor of a web (Mcgill et al. 2006; Vellend 2010). Further, TEK also shares its concept of connectedness with physiological and bio-chemical science that are related to the ecological concept of nutrient cycles (Pierotti & Wildcat 1997). Although the Native understanding of a circle of life is a fundamental part of their spiritual beliefs, it is not grounded on a mystical concept but on a practical recognition that all living organism are literally connected to each other (Pierotti & Wildcat 2000).

2.3.3.3 Sense of Place

In order to receive an understanding of their sense of place, practitioners observe their close surroundings to receive an understanding of their place in history, which is described as thinking spatially (Deloria 1990, 1992). As a result, TEK tends to evolve closely from the place of its use (Turner et al. 2000). Since the transfer of knowledge requires interpersonal relationships based on trust and respect, understandings are rather communicated and shared in person on the land instead of relying on theoretical knowledge on paper (Mason et al. 2012). The stories, values, and social relations that are being transferred within TEK are directly contributing to the survival, reproduction, and evolution of Native cultures and

identities. Also, the features of the local landscape often function as points of reference for communicating tacit knowledge (Cruikshank 1998, 2005). Hence, if the land disappears or endures rapid transformations, the historical connections with the past may break, and thus, change the meaning for current generations. This can result in the erosion of the sense of place and disappearance of culture (Houde 2007). In this vein, TEK highlights the restorative benefits and meanings of landscapes as places for cultural and spiritual renewal (Lewis & Sheppard 2005). These values have developed historically over a long period of time and built the foundation for many peoples' sense of place and construction of identity (Kuhn & Duerden 1996). Various First Nations scholars have stated that TEK emphasises and preserves the strong connections among the consumption of local food, life on the land, and the use of language and meaningful toponyms for the survival of Natives' cultural identity (Kuhn & Duerden 1996; Myers et al. 2005).

2.3.3.4 Living with Nature

Some scholars argue that in order to follow the principles and values of TEK, one has to be Native to a place (Jackson 1995), and to live with nature (Wilson 1992). Yet, being Native to a place does not necessarily presume to be Indigenous. Rather, as Pierotti and Wildcat (2000:1335) claim, being Native to a place requires to live "with the geography and biology of your environment without trying to alter it solely to meet human needs". As a result, practitioners advocate for a sense of place that is in direct opposition to the modern Western view that the natural world exists to be governed. More, living with nature has little in common with the Western concepts such as love, closeness, or conservation of nature, since those notions often promote the idea that the natural world shall be conserved insofar as it benefits human needs (Smith 1984). Rather, it stipulates that humans need to adapt their everyday customs and behaviours in balance with the local ecological and planetary boundaries (Deloria 1992; Anderson 1996).

2.3.3.5 Nature as Home

As a result, practitioners do not consider nature as something distinct, but rather as a part of their home. According to Reichel-Dolmatoff (1996), when Native people leave their shelter and interact with the non-human world they are simply moving into other parts of their home. Further, he asserts that "What we call nature is conceived by Native peoples as an extension of biological man, and therefore a (Native) never feels 'surrounded by nature.' A (Native) walking in the forest, or paddling a canoe is not in nature, but he is entirely surrounded by cultural meanings his tradition has given to his external surroundings" (1996:8–9). Hence, the representation of home is extended to non-human elements, creating a nature-centred belief system. In its origin, Western ecology derives from a similar understanding, since the word ecology comes from the Greek word for house, and

thus, recognises nature as the house of humans (Barrett & Odum 1971; Pierotti & Wildcat 2000).

To conclude, TEK represents a comprehensive body of knowledge, practice, and belief system that is strongly influenced by adaptive processes and relies upon intergenerational and cultural transmission about the relationship of living beings (including humans) with one another and with their environment. It is closely aligned to the local environment and incorporates land and resource management systems that include human and non-human benefits. The ethical system required humans to integrate the non-human world as a part of their ecological and social community, which consequently obliges practitioners to rearrange and adapt their everyday customs and behaviours in balance with the local ecological boundaries and changing environmental circumstances. TEK emphasises the restorative benefits and meanings of landscapes as places for cultural and spiritual renewal and attempts to preserve the strong connections among the consumption of local food, life on the land, and the use of language and meaningful toponyms for the survival of cultural identity. Within TEK, the representation of home is extended to non-human elements, creating a nature-centred belief system. Spirituality and religion play a fundamental role in shaping human's behaviour towards the natural world and defining appropriate interactions. The key aspects of alternative farming methods and TEK that have been identified in the literature will subsequently help to explore how, and if, research participants are mobilising certain elements found within TEK. The following section introduces the methodology and highlights the methodological choices guiding the overall research design, process, and implementation.

3 Methodology

In order to obtain a deeper understanding of participants' specific values and relatedness to nature, this thesis examined their subjective values and (inter)actions with the natural world. It followed a qualitative research design that was influenced by ethnographic and phenomenological notions. The qualitative nature of the research stipulated that the findings could not be replicated and generalised. Each participants' relationship to nature was different, and so were also their interpretations and everyday practices dependent on their specific contexts. Likewise, the thesis acknowledged its double hermeneutic as it made "claims about the claims of other actors" (Bryant 2015:516). As a result, neither the research nor the author was independent from the results, and thus, objectivity could not be reached in any positivistic sense. The research had certain ethnographic elements, since it attempted to capture the descriptions participants gave to their cultural world in their own words. Further, fieldwork was carried out in the participants' natural setting by observing and participating in their lives (Foley 2002). The thesis incorporated certain phenomenological notions, since it aimed to illuminate the

participants' concealed meanings regarding their relatedness to nature by interpreting the their subjective experiences, (inter)actions, and perceptions (Hamilton et al. 2006). Fundamental to this thesis was its interpretative-explorative character, the search for meaning in the participants' narratives and (inter)actions, and its self-conscious research approach. This helped to explore the complexity of participants' perceptions and particular viewpoints and to understand my own personal interpretation of the participants' relatedness to nature (Maggs-Rapport 2000).

3.1 Sampling of Participants

Due to the limited timeframe, the research involved 5 participants. To account for the limited number of participants, but to gain maximum insight, the thesis attempted to ensure homogeneity by selecting a reasonably homogenous sampling group, commonly referred to as purposeful sampling (Coyne 1997; Suri 2011). Potential participants were approached informally through the network organisation Nordiskt Nätverk för Regenerativt Lantbruk (Nordic Network for Regenerative Agriculture) or contacted directly by e-mail or telephone.[6] Participants were chosen based on the following selection criteria. First, prolonged engagement and practice of alternative farming methods to acquire a reasonably amount of knowledge and to register potential changes in their local ecosystem. Second, proficient English skills to reduce the risks of miscommunications and ambiguities. Third, variation in terms of age, social status, and gender. Fourth, different environmental contexts in order to understand how their relationships and understandings of nature might have been influenced by their social, geographical and natural environment.

3.2 Profile of Participants

Study participants were all members or affiliated to the Nordiskt Nätverk för Regenerativt Lantbruk and came from various geographical contexts, ranging from the southern part of Sweden in Skåne to the province of Jämtland. Although they identified themselves as practitioners of regenerative agriculture and/or permaculture, they differed to various degrees in their approaches.[7] Peter was a vegan farmer and did not work with or utilised any animal products on his farm, which was located in Villands Vånga, in the northeast of Skåne. About eleven years ago, he moved alone to the area. Yet, for the past six years, he had lived together with his partner and three children at the place. Peter had studied Human Ecology at the University in Lund and got in touch with permaculture during his studies.

[6] The Nordiskt Nätverk for Regenerativt Lantbruk is an informal network on Facebook that consists of people that are connected in their interest or are practicing regenerative agriculture and permaculture.

[7] All participants allowed for their real names to be used in this study. Hence, the following descriptions include participants real names.

David focused on small-scale permaculture and lived together off-grid with his wife at a 13-hectare homestead, located in Brattfors close to Hedemora. Both had been practicing permaculture for the past seven years and were previously involved in another permaculture initiave. But last year in April, they decided to start their own project and moved to their current place. Gunnar had been practising organic agriculture for the past forty years at various places in Sweden and was one of the founding members of KRAV.[8] Five years ago, he and his wife moved to Järlåsa, a few kilometres west from Uppsala, where they ran a small-scale organic farm with some cows for grazing purposes. Jörgen had been living in Undersåker, a small village located close to Åre, for the past thirty years. He owned over five hundred sheep and 14 cows and practiced holistic management grazing, a systems thinking approach to managing natural resources. He was also an active member of the Savory Institute.[9] Sami lived together with Jörgen and had been practicing organic agriculture for various years in Finland. In the past year, he got in contact with holistic management, and therefore, lived together with Jörgen and other volunteers to learn from his knowledge in holistic management and farming.

3.3 Ethical Considerations

The qualitative research design required the adoption of several ethical principles to data collection and analysis to guarantee the participants' rights, needs, values, and desires (Lewis 2015; Doody & Bailey 2016). First, prior to data collection, all participants were informed about the research objectives as well as the impact of their participation. Second, participation in the study was completely voluntary. Third, participants had the right to remain anonymous and to reject their involvement at any time throughout the research process. Fourth, data were collected solely for the objectives of the research. Fifth, participants had the opportunity to read and receive verbatim transcripts, written interpretations, and a final copy of the research to ensure transparency and accuracy. Sixth, given the circumstances of the current pandemic, the safety regulations of the Swedish Ministry of Health were strictly followed to protect the personal health of all actors involved in the research process. This had the highest priority since the research involved travelling and an on-site field study in the participants' natural setting.

[8] KRAV was founded in 1985 and it is the main Swedish organisation that develops and maintains regulations for ecological sustainable agriculture.

[9] The Savory Institute is a global network of learning Hubs that attempts to facilitate large-scale regeneration of the world's grasslands through Holistic Management. It aims to empower farmers, ranchers, and pastoralists to use properly-managed livestock as a means to regenerate land and livelihoods (Savory Institute).

3.4 The Researchers' Role

Self-reflection and the primacy of subjective experience were fundamental throughout the research process and denoted that I was a part of the study and consequently affected by it. Hence, my personal values, experiences, and potential biases that could have influenced the research design, the interactions with participants, and the interpretation of data needed to be identified (Creswell & Creswell 2018). For example, my previous research, on alternative food networks and the rights of Indigenous communities within the management of natural resources have significantly enhanced my awareness, knowledge, and sensitivity towards the topic. Also, the motivation for this enquiry was to provide meaningful knowledge that could contribute to changing our current understanding of nature. In my opinion, these factors helped to build a notion of trust and reciprocity with the research participants. However, being a foreigner and not fluent in Swedish may have affected how openly participants expressed themselves during the interviews and field visits, since there could have been aspects that might have been difficult to explain in a foreign language. Also, participants might have felt discouraged to share their subjective relationships to nature in another language than their mother tongue. Nevertheless, I believe that these factors also had a potential advantage in the research process. Being an advocate of alternative farming methods but also a foreigner helped to understand the participants' specific contexts from various perspectives. Moreover, by selecting participants who were fluent in English, an interpreter was not required. As a result, I could directly interact with the participants and hence, avoided the dilemma of having views filtered through the specific perspectives and translation of another person. Also, having to communicate in a second language might have contributed to a more reflexive and conscious attitude given the fact that participants had to express themselves more thoughtfully to find the right words or descriptions that could match their feelings or attitudes towards nature. Throughout the research process, I was aware of my preconceived notions and the connected benefits and disadvantages that were associated to my characteristics as a person. This supported the research in identifying clashing values or assumptions in the data and helped to actively reflect upon those notions. Consequently, I brought certain predefined ideas to this study that might have had an impact on the data collection and analysis. However, I did not interpret the data on face value but reflected upon it from various hypothetical perspectives. Given the fact that I was the only person conducting the entire study, it is important to mention that the arguments presented in this research predominantly reflect my specific subjective interpretations. Hence, I assume the entire responsibility of every aspect of the thesis, being positive or negative.

3.5 Interview and Observation Guide

Prior to on-site data collection, various practitioners were contacted to conduct online-interviews via Zoom. This first period was performed to test and adapt the subsequent on-site interview and observation guide, and to select suitable participants for the study. The online interviews included topics, such as motivations to practice alternative farming methods, and understandings of nature and ecosystems dynamics. After study participants were selected, a more suitable interview and observation guide was constructed. In order to demonstrate the extent to which participants mobilised certain elements of TEK, the guide consisted of a series of open-ended questions that focused on area description and characteristics, landscape change, the generation and use of ecological knowledge, the various approaches to land use management, and relationships with the non-human world (See Appendix).

3.6 Data Collection Procedures

For primary data collection, on-site field visits of several days' duration were conducted using multiple methods including interviews and observations. Some participants were not available for on-site field visits. Instead, several online interviews were conducted via Zoom. There were multiple benefits of having field visits of several days' duration. For example, in order to more thoroughly understand participants' values and motivations, prolonged engagement was essential to build a feeling of trust and reciprocity. Such an experience enabled to build a closer relationship for a more in-depth portrait of the participants. The option of varying roles shifting from a non-participant to an active participant in the ongoing research process was also considered, in order to build a closer relationship with the participants. Participants' were encouraged to freely express their opinions and be valued as a person and not simply as a researched object. These measures supported participants to express their views in their own words and to understand the specific context and individual setting in which they live in and make sense of their world (Crotty 1998).

3.6.1 Review of Academic Studies and Grey Literature

Since the main purpose of this study was to examine the specific human-nature relationships of participants practising alternative farming methods, insights into TEK and its relatedness to nature were mainly captured through a review of academic studies and grey literature.[10] Although online expert interviews with informants having an in-depth understanding of TEK could have helped to provide a richer and more detailed understanding of TEK, the limited timeframe and scope of this research did not allow to do so. However, the use of academic studies and

[10] Grey literature is literature that is not formally published in academic sources such as books or journals.

grey literature as evidence synthesis helped to obtain a more extensive selection of available data that were applicable to the enquiry. More in-depth knowledge about permaculture and regenerative agriculture was obtained through a literature review of published scholarly articles and conceptual handbooks. With a focus on participants relatedness towards nature, the research was more directed towards the personal (re)presentations of participants' (inter)actions with nature, and how they were perceived through their everyday practices. Hence, the research specifically concentrated on how participants described their own practices, elaborated upon their motivations, and demonstrated their perceptions about nature.

3.6.2 Interviews

In order to adapt to every specific situation and participant, semi-structured and face-to-face in-depth interviews were performed using open-ended questions (see Appendix). The purpose of this method was to discuss and explore participants' perceptions and values. An active dialogue was attempted, in which participants could openly describe their personal motivations, practices, and thoughts concerning their relatedness to and understanding of nature. Hence, every interview differed from each other and additional questions were asked that diverged from the predesigned interview guide, depending on the relevant context. Being flexible and able to adapt to each specific context helped to generate important findings that would not have been possible to capture with a more structured interview method. It was often in moments of unpredictability that major findings were revealed that had an important impact on the quality of the study. To ensure that the relevant information was captured in these moments, I double-checked participants' expressed information by repeating their own interpretation of their words to either confirm their descriptions or to provide further explanations. The average length of the interviews was around one hour. Interviews were performed at the participants' home, workplace or any other location selected by the participant in order to encourage them to freely express their opinions and to make them as comfortable as possible. At the beginning of every interview, participants were informed about the purpose and aim of the meeting. Although participants were selected based on their language proficiency, misunderstandings and ambiguities during the conversations did occur. Therefore, I recorded the interviews, with previous informed consent, with support of Otter, an application that transcribed spoken language directly into written text in order to be able to listen to the conversation again. This provided the benefit to give the best attention to the participant and to ensure that the interpretation of the findings was as accurate as possible. Nevertheless, all participants decided whether to be recorded or not. The transcription of the interviews indicated changes in intonation and pauses with the purpose to capture a wholistic picture of the participants' expressions. In case

quotes were used, they were taken directly from the interview transcripts but might have been altered, when required, to represent idiomatic English.

3.6.3 Observations

Observations were also performed by taking field notes of the participants' activities in an unstructured form. I considered the option of varying roles shifting from a non-participant to an active participant in the ongoing research process. This depended on the relevant context and required my capacity to be self-reflective and to understand how to utilise the specific situation in order to obtain valuable insights. During the more passive observations, I walked through the landscape to gain a general impression of the area. The purpose of this method was to obtain a mental map of the location and to acquire a good sense of orientation about specific places to which participants referred to during the interviews. This method helped to acquire a deeper understanding of the places, and in particular the feelings, that participants attached to their local environment. During the active participation, I attempted to obtain first-hand insights with a critical self-reflective form of co-experiencing and participating in participants' everyday practices, labelled as "observant participation" (Honer & Hitzler 2015:552). The purpose of observant participation was to gather observation data *and* data on lived experience. I entered the field with the willingness to engage as much as possible in participants everyday practices, in order to become directly involved in their daily lives (Reichertz 2007), and to obtain closer insights into participants' relatedness to nature. This required to take different roles and join various activities, such as working in the field, taking care of animals, going for common walks, or helping to prepare meals. Hence, I did not only observe the participants, but also myself while simultaneously participating *and* observing. This helped to generate data that revealed the participants' subjective values and specific understandings (Luckmann 1970).

3.7 Data Analysis Procedures

Data interpretation commenced during data collection procedures. First, I reflected upon my own preconceptions about the data, and second, attempted to suspend these to a certain extent in order to get to the essence of participants' descriptions. For example, I explored whether participants' individual descriptions of their everyday practices and values contradicted or reinforced each other. Hence, examples of (in)congruence in the narrative were explored to find the essence of their descriptions. Throughout this process, I attempted to uncover the meanings of these descriptions and to understand the participants' specific relationships to nature. However, once data collection was completed, I employed a process of reasoning with the data.

3.7.1 Data Reasoning

In this vein, participants' accounts were assessed through an interactive process of several stages. First, comprehensive reading of transcripts. Second, extracting significant statements and identifying key words and sentences. Third, formulating and clustering the statements into recurring themes. Fourth, incorporating the resulting themes into a description. Fifth, synthesising these themes to a structure that provided an explanation for the behaviour. As a consequence, the findings represent a combination between my own interpretation and the perspectives of the participants. Moreover, data analysis involved the search for patterns and ideas that supported to explain the occurrence of such patterns. This was exercised through a content analysis by identifying categories within the data and by integrating the data into a series of sections that were subsequently reorganised under a set of thematic headings.

3.7.2 Coding and Content Analysis

I applied a descriptive and structured (predefined) coding method in combination with an iterative, interpretative process of textual open coding, which allowed for new themes, patterns, and relationships to emerge from the data (Bussey et al. 2016). The coding and content analysis helped to pool the data and to connect the constructed categories (Goulding 2005). The predefined codes were derived from the principles of TEK, identified in the literature, and included the themes of respect, social bonds, local places and rootedness, and interdependence and connection. Transcripts were coded correspondingly in substantive detail in order to transit from participants' perspectives to my interpretation of the meaning of those descriptions. At the same time, new codes that were useful for the purpose of this enquiry emerged throughout the observational and dialogical data analysis, which were integrated in the analytical process. This process of textual open coding identified the themes of complexity and responsibility. Subsequently, the data was reduced into specific units and themes following ethnographic data analysis techniques. This procedure was supported by developing a classification of certain typologies to improve the results of the data analysis. The analysis concentrated on participants understandings and values and attempted to highlight the individuality of their own experiences and principles. The purpose was to search for similarities and shared themes within the narratives, and to discover the essence of participants' descriptions in relation to the natural world.

3.7.3 Data Triangulation

Data triangulation supported to highlight the specific interpretation of the participants' relatedness to nature, since it helped to "map out, or explain more fully, the richness and complexity of human behaviour by studying it from more

than one standpoint" (Cohen et al. 2018:265). The analysis consisted of the insights from interviews, observations, and fieldnotes in combination with a literature review on alternative farming methods and TEK. In reviewing the data, the research concentrated on the guiding research questions and the identified principles of TEK. The idea was to exemplify the potential connections among the implemented data collection methods regarding their insights into participants' relatedness towards nature. This process was facilitated by the coding scheme that connected participants (inter)actions, perceptions, and values towards nature, which I observed, listened to, and participated in during the research process.

3.8 Strategies for validating Findings

To increase the probability of producing credible findings, the study focused on a prolonged engagement in combination with persistent observation of the participants. This provided the potential of building trust and to immerse in a more meaningful exchange with a higher probability of a more in-depth and personal account. The following activities were also employed in order to control the quality in findings (Sangasubana 2011).

3.8.1 Reactivity

Reactivity refers in which degree the researchers' presence has an influence on the participants behaviour. In this way, I attempted to refrain from unobtrusive or disruptive behaviour in order to get faster acquainted to the participants' context.

3.8.2 Reliability

Reliability is the ability to collect data internally and externally in a consistent and credible manner. Data are internally consistent when behaviours are recorded consistently over a prolonged period of time and in various social contexts. External consistency is accomplished by verifying or triangulating data with other sources. Credibility of information also needed to be assessed, since participants' shared perceptions could have been guided by misinformation, evasions or omissions. Hence, this required my awareness and ability to examine participants' behaviour and shared meanings from various perspectives (Neuman 2003).

3.8.3 Validity

Validity relies on the researchers' ability to collect and analyse data accurately, meaning truthfully representing the participant's viewpoints. This can be achieved by ecological validity, which refers to the degree to which the collected and analysed data reflects the participants' viewpoints. Further, if requested, the research provides a natural history, a full description and disclosure of the researchers' actions, assumptions, and procedures, for other scholars and in

particular participants to evaluate the accuracy of their perspectives. Having competent insider performance, meaning the ability to participate in participants' everyday practices, was also pursued (Sangasubana 2011). Caring for deep and closer relationships with the natural world may have the potential to change our agricultural system and relatedness to nature. Such an understanding may represent one potential way of restoring the centrality of nature and to create a better future. Thus, the findings and conclusions shall have pragmatic relevance and transferability beyond the study itself to motivate further research and in particular action (Angrosino 2007).

4 Empirical Findings

This chapter presents the key insights concerning participants' specific values and interactions with the natural world. The findings represent a synthesis from the data obtained during interviews, observations, and direct participation in the everyday practices of participants. The structure of this section is influenced by the content and the sequence of the questions from the semi-structured interviews, and hence, moves from more general to more specific topics. This section helps, in particular, to build the foundation for the second guiding research question concerning how the principles within TEK are reflected and mobilised in participants' values and everyday practices (see section 1.2). The insights provided by David and Jörgen are richer in detail in comparison to the other participants because I was able to visit their places for the longest time.

4.1 Caring Relationships and Interactions with the natural World

When I asked participants to describe their relationships with nature and other non-human beings, they often referred to as having a close, and caring relationship based on a responsibility to share the landscape together. For example, Peter stressed that "we belong in nature*"* and "if you take part in the land you're also responsible to make it survive and […] see that it flourishes […] you have to take care of it" (2021a). He further emphasised that "between me and the plants in our gardening patches […] I have to take care of them otherwise they would not survive". At the same time, he highlighted how this relationship made him feel "the connection between what resources you use and what's happening in nature […] I also feel more connected to food in general you know […] When you grow something […] and you almost recognise the carrots you pull up, and you tend it for a long while, you get a really nice relationship, which makes you understand how much work there is […] in providing organic food". When he further described his relationship with the natural world, he emphasised that he was trying to "provide living space for native and wild animals and plants, such as bees, but I want them to go there by themselves" and "to let the wild come in here as much as possible around the

farming area […] so we try to invite the wild and using the wild to solve our problems". In this way, he highlighted that his role as a human was to facilitate and create the right circumstances for other species to settle in the local landscape.

Gunnar highlighted his personal relationship with his cows. He demonstrated an intimate knowledge and highlighted that some wanted "to have more privacy […] while other cows rather like to have company. So yeah, they are different personalities" (2021). He described them "as sentient beings" and emphasised that "they are tame and domesticated […] but are more by themselves, […] and we learn how to read their signals what they want to do".

Jörgen elaborated upon his motivations to perform holistic management and regenerative agriculture and stressed that "there is no way for anyone to have a good life, if we do not take care of all the plants and animals and everything else […] in order to have a vital biosphere to reside within" (2021). Although he admitted to "have a human-oriented focus" and that his main incentive to "nurture the so-called nature, with all its life", was to be appreciated and "to create some kind of a safe space for my children and fellow people in the future", he highlighted that these motivations "still give me all the reason I can think of to take care of nature".

To describe his relationship with the natural world, David told the story when he and his wife moved to their current place in Brattfors. He underlined that "We moved into our ecosystem, and tried to exist within it. Most people would completely dominate the landscape, build a house on a flat surface. Fields with monoculture […] and then have that as their centre point […] We're different in that way that we're coming to the place, and like slowly starting to move around in the space and interact with it as well as we can." In this vein, he highlighted that "we want to build local resources. That means food, energy, water, social structures, housing. We want to build these things up […] in a way that over time, we put in less and less work, because we have more and more infrastructure in place, and the ecosystems around us, the bioregion here, should be regenerated […] and be able to produce more resources, both for us and other living beings that we share the space with. […] Whether those are birds, insects, microbes, or beavers. We want to build local resources, and […] promote regenerative living […] and over time design things in a way that that they will take care of us". David further mentioned that they were constantly asking themselves "how do we live together in this space and […] how to make it work for all the living things involved". In this way, he stressed the importance to "realise that as a human being you are one of the animals in the landscape. And, you are entitled […] to create your own habitat and your own living space, as every animal is". Moreover, he underscored that "we try to observe the nature around us and have respect for it. And at the same time, claim space for our own human activities and needs, but without disturbing the natural processes too much and preferably even helping them succeed a little bit faster". In this regard, he used the example of how they decided to create a deciduous forest

in their area with a “balanced soil pH level that will work for other fruit trees, bushes, plants, perennials, and that will benefit us as humans, but also wildlife”. He further emphasised that their attempt was “an interesting combination of wilderness, and somewhat managed areas”. David mentioned that at their previous place, they experienced a wild fox attack that killed some of their chickens. Thereupon, I asked how he interpreted the situation and reacted upon it. He responded that instead of denunciating and hunting down the fox, they were trying to “claim the space for us as humans, and to set a natural boundary, which animals such as foxes, or wild boar […] understand as an active spot of human activity, and they stay away”. He asserted that it worked out for the most part relatively well, but admitted that another attack “will probably happen one day sooner or later, and that's just part of the game”. However, instead of trying to control and protect the chickens, he wanted them to be able to roam freely and not be locked-in, because “that will affect the way they live their lives”.

4.2 The Respect for Non-Human Entities

All participants shared a similar set of values that highlighted the importance of respect and dignity towards the natural world. Peter, for example, argued that he attempted to give non-human elements the opportunity to claim their space in the landscape, highlighting his motivation to co-inhabit his local ecosystem with other species. This became evident when he underlined “I try to be respectful and not to harm other species” and emphasised that he was “trying to mimic nature as far as it goes and still be able as humans to find our place on this spot”. He also mentioned that “my philosophy is, I share this land with whoever's on it […] and to leave as much room, as possible for wild animals”. He described this process as “having the inner dialogue […] about the connection to all other livings here […] so it's a compromise” (2021a). In this way, he highlighted his goal to create agricultural practices that were beneficial for nature and the local ecosystem. Sami underlined “whether it's the regeneration of the soil or looking after the animals that you work with […] and at the same time as we are part of nature in that sense that we eat the animals, we clothe ourselves with the animals, and we make our […] shelters out of the animals […] while doing that having respect to diversity” (2021).

During the field visits with Jörgen and David, we talked about their experiences of killing and slaughtering an animal. Jörgen referred to his personal upbringing and explained that he had to teach himself how to kill kittens at a young age. He expressed that back then “there was no other one around that was just me knowing that needed to be done” (2021). He described this experience as “horrible” and that he was trying to find ways to inflict the least possible pain and distress. He mentioned that “those experiences were not an easy thing […] it is not easy for anyone, and there's a lot of emotions in this, and it should be”. But, as a result, he argued that, he learnt from a young age that death was a fundamental part of life,

and therefore, needed to be treated with the greatest respect as possible. In this way, he emphasised the importance of a high quality of death, “since we are feeding from the flesh of these animals, we should be very careful with how we are taking their lives”. When he further elaborated upon his feelings and thoughts of killing an animal, he mentioned a story, which highlighted the importance of treating each living being with the same respect and dignity as your best friend. He explained that a Native American friend told him this story, who referred to it as the dog ceremony. Jörgen said, that within that particular Native American community, in order for a boy to become an adult he was responsible for taking care of a puppy and to “share the sleeping place and the food and everything with this puppy for a couple of months […] and the kind of relation that a boy and a puppy can have is like enormous”. When the dog was no longer a small puppy, the boy had the responsibility to take the life of the animal, since in that community “eating dogs were the natural thing and dogs were serving that purpose”. This event had the purpose of a ceremony, in which the whole community was participating in the pain and emotions that the boy was going through. Jörgen argued that “participating in the killing of such a friend like this dog and the message delivered in this is that later in life, there will never come another life to be killed worthy of less respect than this dog. So, if you are going to kill anyone, at any time, you should remember this dog because […] it is worth the same as the dog”

David also underlined that it “was never easy for me to do. I felt very shaky and had a lot of respect for the whole process of killing an animal and taking its life” (2021). He further stressed the importance of having a close relationship to his animals during their lifetime in order to provide a respectful ending of that life. He argued that it was fundamental to respect “the whole species by making sure that they can procreate, in a healthy way and have a healthy environment”. He also highlighted the importance of killing an animal in order to “know the suffering and what it feels like and […] to really know what it is I'm putting inside my body and to have some relationship to it”. To demonstrate his principles of respect and gratitude, David described the process of killing a chicken. He told me that after removing the head, it was important to him “to hold it (the chicken) under my knee and just feel the life leaving the bird […] in my mind and intention […] I am with the spirit of the bird, leaving the body. So, I stay calm with it, and from a space of gratitude and thankfulness release the bird to the universe”. He explained that the hardest part for him during this process was “when the life is actually leaving the animal”. When I asked him if he was able to give the same amount of gratitude and respect towards each animal he was killing, he confirmed that he was trying as much as he could, but admitted that when they were killing more chickens in one day “it is kind of like a process line […] then it is hard to have respect for every animal in that tempo”. In this way, he referred to the shortcomings of industrial slaughtering processes and argued that “the bigger it gets, the less respect you have”.

4.3 Interdependence and Complexity

When participants shared their understandings of ecosystems and dynamics within nature, all highlighted the complexity and interdependence found within the natural world between the various elements. For example, Sami answered that he thinks of "the ever-interconnected nature, […] which we are a part of, which everything […] is a part of" (2021). Jörgen mentioned that when he started regenerative agriculture and holistic management, he began to rediscover the synergies between the animals on the land and "producing food within a whole functional ecosystem […] something that I didn't realise before […] and learning about those ecosystem processes and how my animals are my tool to make those processes" (2021). At the same time, he also referred to all the other species and elements found within the landscape and stressed "how we as a species among other species are collaborating in the ecosystem". He underlined the importance of his actions, since "we are deciding the features of that landscape […] and the community dynamics of all the species involved. All those things are to a higher degree a consequence of our actions as homo sapiens within that". While he was explaining his approach to regenerative agriculture, he admitted that "it's hard to do this […] you are going to deal with your view on nature […] and who you are in nature […] And the way I have come to see it, is that we are recovering from […] that physical and mental barrier between ourselves and nature to which we rightfully belong to". He also highlighted that he did not want to use the word farming because it stipulated a separation between humans and nature. Instead, he said "I'm in a landscape here and […] I've been having different roles in this landscape […] initiating and leading […] a pastoralist community" attempting to let "animals thrive in that landscape". When he further elaborated about the connections and interdependences of all the elements in an ecosystem he used the metaphor of a "symphonic orchestra with an enormous number of instruments making one music together". In this way, he emphasised that "no individual plant or animal or any other kind of creature can be understood, alone, […] They are making this music together […] so that music is the result of all those creatures, collaborating, and the interdependence between them". Thereupon, I asked him how the music was sounding to him at that particular moment. He answered that "we as a species on this planet have chosen to be so unaware of this music, or how we are affecting it. It is out of tune". However, at the same time, he stressed that humans have the potential to change by emphasising that "as soon as we make ourselves aware of our impact, being able to tune in ourselves, as a way of making that music more beautiful […] there is an enormous potential of beautiful music out of tune […] to get […] more harmonic". He continued by highlighting that "I see it as a quest for myself to spend time on figuring out why things are the way they are, how things are interacting with each other and how I'm interacting with all those mysteries". It was fundamental for him "to have this map of understanding […] and it's a lifelong learning to understand

how our plants and animals and ourselves, myself and my fellow people, are having an impact on each other all the time, and […] how I can create actions that are seemingly positive".

To demonstrate his understanding of nature, David emphasised that "I see nature, and even farming as something that is constantly changing and evolving […] and it doesn't feel right to me to exclude wildlife from the habitat that they want to be in". He further underlined that "one of the most interesting things to understand about nature is that it's complex". But, at the same time, he underscored that "the flip side of this is that it can be super simple if you try to exist with the complexities […] You don't have to do anything more but support the system". He then concluded "the more we can support the complex structures of our own bodies, and the bioregional bodies, and the ecosystem bodies that we exist in, the more we can support those complexities, the better off we are and the better off everyone is" (2021). In this way, he criticised how most people who live in urban areas "have no idea what nature is […] They have no connection and no relationship to it […] Therefore, they have no idea why it's important to try to save it".

Gunnar underlined that he did not like to use the word nature "as it assumes a separation between us and nature […] and I want to see that as much as integrated as possible". Following, he emphasised his motivation "to share the landscape with many other organisms" and described his way of farming as "a kind of juggling of many different things at the same time". He explained the various interactions within his ecosystem by highlighting that "the cattle integrates very easily with a lot of other natural processes, […] the grazing areas are full of birds, and geese, and deer, and other animals, and the nice plants […] and so I think that kind of ecological system is superior" (2021). Yet, he underscored the importance of context-specific circumstances and further highlighted "there's a lot of interaction between me and what we grow, and the animals we have and wildlife, which is not harmonious […], so it's a kind of balancing act". In this way, he advocated that "farms should be very diverse and integrate both animals and plants and try to grow many different crops and use all the ecological niches in the landscape in a responsible way". Following, he mentioned that "I see farming as a planetary stewardship thing […] being a kind of management of the planet […] and actually our main tool […] to interact with the rest of the living". Gunnar underlined that one of his main interests was the creation of "as many border zones as possible between the forests and the land […] between the lake and the land, and the animals and plants, and try them to interact as much as possible". He continued by emphasising that "we have so many different nature types, we have the lake, we have the shore, we have the wetlands, we have the forest, we have bogs, we have all the zones in between the different landscapes […] where you have most interaction and most interesting things are happening". He concluded "the forests, the animals, the vegetables, myself as a person, our house, the firewood, it belongs

together in an organic way". According to him, the interactions and inclusion of the various elements in the local ecosystem provided him also a sense of meaning and intellectual inspiration in his other vocation as a writer.

4.4 The Importance of close Communities

When participants elaborated upon their understandings of community, all focused on human communities. However, some participants also acknowledged the wider ecological community, comprising of elements that transcend the human boundaries. Although they recognised to be part of a wider ecological community, it was rather a more practical understanding than an emotional or spiritual connection. For example, Peter mentioned the importance of closer human communities because it "makes it easier for me to live here". He further stressed that "it's really important to connect to the community that was here before […] because I'm not inborn here […] so, I think it's really important to […] do something that helps the community here". When he referred to nature in this regard, he answered that "I wouldn't describe nature as community for me […] it wouldn't feel natural to me […] I guess people do that, who are more spiritual towards nature" (2021a).

Gunnar emphasised the importance of reconstructing the relationships between people and to rebuild the connection between people and the local land. In this way, he mentioned that "today we see markets as […] the main relations intermediation between people […] especially for food". In contrast, he stressed that "I love selling directly to consumers, it's still the market but you are actually building direct relationships […] in that way and you can slowly build up new relationships". He mentioned the advantages of building a closer local community and highlighted that "even our neighbours here, they participate a bit in our farm management and they help us a bit, if we want to go away, they look after the cows and then they get some meat from us" (2021).

Sami answered "I suppose the closest one that we experience is possibly people […] who see themselves as being a community and […] feel a connection to other people". But at the same time, he mentioned that there is also "the bigger environmental community that we can have". He further emphasised that the concept of community was "not rigid" and referred to his various relationships to the animals on the farm, but also to the diverse elements in the landscape depending on the season. In this way, as winter was slowly passing and the landscape was changing, he underlined "the community seems to be growing" (2021).

Similar to Gunnar, Jörgen highlighted the necessity "to recover from the barrier between people" and to rebuild closer community relationships. Although he concentrated on the community between people, he also emphasised that "almost equally important, will be the relation to the landscape that we, as a community (of people) are a part of". He further underlined that the communities between people,

but also the connections with the natural world, were “multi-levelled”. Another aspect that came into his mind when he described his understanding of community was the event when he encountered holistic management. He described this situation as “a coming home feeling […] seeing that here was a whole language and community, putting the pieces together, or making sense of all the stuff that I have been so interested in for my life”. In this sense, he stressed the sensation of feeling “no longer alone […] That was like, having […] a home of people finding one's flock”. He further underlined how community was for him “a feeling […] to be a part of, and to belong to […] a community of people” that is “more than any geographical thing”. He also mentioned that this community assisted him in discussing and finding the right ethical behaviour, since “the likelihood for the action to become something good is significantly higher if I've been using the collective intelligence […] of the community” (2021).

David also emphasised the importance of “living in a community with people who are like-minded […] and oftentimes […] the community tries to support an atmosphere of love and taking care of each other, and I really like that part of community”. He mentioned that since his childhood, he had lived in close communities. Although he was highlighting the positive aspects of living together in such a form, he also underlined some complications, such as decision-making procedures, dysfunctional rules and regulations, and spending “a lot of time dealing with people's emotions and less time doing something”. These factors had been one of the reasons for him and his wife to start their own project. In this way, he mentioned that “what we sacrificed in one way by coming here is the community, a little bit. But what we gained is a lot more nature and a lot more freedom […] and the ability to just do whatever we want”. He continued by emphasising that his understanding of community transcended human boundaries, and also included, for example “the interactions between mycorrhizal fungi and bacteria and nematodes […], or a community of trees and birds […] there's all kinds of ways to define a community”. When I asked him what aspects he considered as parts of his community, he answered “It's a holistic thing […] we're trying to be part of this whole place. So, the whole place is a community, everything that includes the trees, the beavers, the turkeys, the chickens, the rabbits, the humans […] it all turns into part of the community […] in a regenerative cycle” (2021).

4.5 Nature as Home

When participants elaborated upon the aspects they considered as parts of their home, all agreed that nature played a fundamental role. Also, most participants mentioned that they connected various positive childhood memories with spending time outside, and hence, developed an intimate connection and appreciation for the natural world. Peter emphasised the importance of connecting with other people and to the local environment to “feel more rooted” (2021a). He also connected

various childhood memories with spending time in nature, which significantly shaped his understanding of home. In this way, he highlighted “I was a lot in the Archipelago when I was young and I would still say maybe that's the deepest connection to nature I have […] when I went out there, I still feel closest to nature”. Subsequently, he explained what he considered as part of his home at his current place and emphasised “when I look out from where I stay, I see a lot of forest and I can walk in it […] and I feel like this is part of me and part of my kids and my families place, we pick mushrooms, we play there, we do this and that […] owning it in a spiritual way” (2021b).

Gunnar responded in a similar way and mentioned “nature plays quite a big role for me in the home concept […] I would say nature is probably more important than people for me to feel at home”. He also asserted that “this familiarity that makes home for me a place where you feel you belong and you can both […] recognise things but you also see change”. He used the example of when he moved from Värmland back to Uppsala that “almost 40 years later I could go to a tree and remember that particular tree from when I was a child, maybe that I kissed a girl by that tree […] for me at home doesn't have to mean this house, […] it's a place where I feel belonging” (2021).

Sami referred to his childhood and how he spent his entire summer vacations at different farms on the countryside. He underlined that “I believe that has affected a lot the feeling that I get in the countryside”. He continued by emphasising “I very often feel at home when I’m in nature […] but I suppose it's the feeling that we can have anywhere”. To demonstrate his point, he shared his experience of hitchhiking in Siberia “in the middle of nowhere” and stressed “in that sense there doesn't need to be any other people to feel at home”. However, at the same time, he underlined that “you can have this feeling for example also with other people […] especially with Jörgen and the people over here, it can feel at home”. When he further described his feelings connected to home, he said “I suppose, at peace […] it is some like meditative state […] that you don't […] want to be somewhere else […] there is not this desire to be somewhere doing something […] that's being at home” (2021).

David also referred to his childhood and mentioned that between the ages of 4 to 17, “I was growing up in Montana in the United States […] next to Yellowstone Park in a place called Paradise Valley, which is basically the most beautiful piece of nature”. He continued and stressed “I spent my entire childhood outside in nature […] when I got off the bus from school to come home, I didn't go home, I ran around in the mountains and hills until dinnertime […] And I did that my whole upbringing and that kind of leaves a very deep sense of appreciation for nature, large deep within yourself”. In this way, he underlined that for him “a home is a place where there is a lot of nature around […] There is some kind of security some feeling of resilience and self-sufficiency. That makes me feel at home”. Yet, he also

highlighted that home also included “definitely other close people […] And I can feel that feeling in different places”. Similar to Gunnar, he described his feeling of being at home as “a very nice, relaxing feeling, that also inspires me to do creative work” (2021).

4.6 Experiences, Observations, and Personal Stories

When participants explained how they were generating ecological knowledge, all emphasised their own experiences, gathered knowledge from within their permaculture and regenerative agriculture community, and their attempt to recover local and traditional knowledges. Concerning the transfer of knowledge, many emphasised the importance to pass on their generated ecological knowledge to future generations and other people. Peter highlighted that it was “really important for me to […] get the word out, […] and that people will start up and see for themselves”. Further, he emphasised that one of the biggest motivations for him to disseminate his knowledge was “to give back […] what you have, and not […] only capitalise on your ideas, also you have to give back to nature […] if you learn something, give it, pass it on” (2021a). He also mentioned that the sharing of knowledge was a fundamental part within the permaculture movement, which helped “to learn of your experiences, good or bad, so it will be easier for the community […] and you […] don't have to do the same mistakes”. Yet, the most important aspect to him, was to reconnect with his own family heritage and to pass on his knowledge to his children. He shared that his grandfather was an agronomist, but afterwards “my father did something totally else, but now suddenly […] my father's brothers and […] the family understand […] we were farmers and so […] I am going to teach my kids”. The regeneration of traditional and local knowledge was another aspect we further discussed and he explained how “back in the days, people had […] a lot of knowledge through older generations living on the land, who can tell you how to do what […] or made the right choices by planting stuff in the forest or in nature”. He continued and emphasised that nowadays, “those chains of knowledge are broken” and that “a big difference from before, in the smaller farming community was, […] It (the knowledge) was built in generations, but now it's more like a green movement, people move from […] the city to nature, or into rural areas, but they maybe did not grow up there or have any relatives there, […] so they are making all those connections again and finding all the information, and it's hard”. In this way, he referred to himself when he moved to his current place and highlighted that “I didn't know anyone out here, so I had to find them (the knowledge) myself”. He emphasised that “I'm building them (the knowledge) now for my kids to inherit later, so […] we are all starting over again […] like building those essential knowledges that we hopefully could hand over to our kids”. He also suggested that “We have to take in all the knowledge from before from Indigenous

and from small-scale farmers […] And then […] we have to forge those knowledges and […] live in a way, which leaves as much land as possible for the wild again".
Gunnar mentioned that he had only been living on his current place for the past five years, and hence, emphasised that he was still finding ways how to best interact with the soil and local species. He further stressed that "we shouldn't try to produce everything everywhere and we should try to find out what fits really in this ecological niche where we are, rather than trying to grow everything just because we want to grow it" (2021). He also elaborated upon his motivations to restructure the converted forest back into grazing areas and explained when he and his wife moved to the farm, they found old maps and "we saw that the landscape was very open, […] there was no dense forest here […] it was semi grazed forest or semi grazed natural grasslands. So, we tried to restructure that". When he described his way of obtaining knowledge, he mentioned that he learnt some things from his mother, who was "very knowledgeable". He also generated knowledge from "older generations and books and trial and error, all of them together". Further, he mentioned that he found some inspiration from certain Indigenous and small-scale farming communities, which "have managed their landscape in some way that made sense for them and they have developed their thinking and their myths, their religions, their worldview […] in some kind of harmony with the material living". However, at the same time, he highlighted that "whether you have defined them as Indigenous or not is not so important in that sense".
When Jörgen explained his generation of knowledge, he highlighted "by observing and communicating, tapping into whatever accumulated experience I can find from all the people living at the same time, and who have been living before me". He further emphasised his motivation "to carry the accumulated knowledge and wisdom […] and to pass that on or even […] try to improve that". Yet, one of the most important aspects for him was to observe "any action that you are taking yourself or any action that you can observe of other people […] try to see what are the consequences […] what was the intention […] and what unintended consequences seem to have been caused by that action […] So it has to do a lot with stuff inside your own head, but as well the outside" (2021). For him, this was one of "the big takeaways from this holistic management […] that kind of questioning". To further demonstrate his point, he explained that, as a young adult, he got himself a book about bees and started a beehive. For a couple of years, he was studying their behaviour and used the book as "being my tapping into other people's accumulated knowledge […] and then compare that to my own observations, and my own doings, and my own working with the bees". He was fascinated by the impact of "introducing the bees in that peace of landscape, enabling them to shape that landscape" and he described it as "a complexity that is just beyond comprehension […] they are making decisions in that kind of complexity, optimising their own society as they are optimising their own landscape, it is just

mind-blowing". And from there on, "I could just never get enough of trying to get myself into that kind of understanding […] and a part of that enjoyment would be my management, how I could support these insects to survive winter, and to provide honey, and to expand, and all those things by managing them or by manipulating them with my technical tools […] that made me a part of that system". Concerning the transfer of his knowledge, Jörgen referred back to his childhood when he needed to teach himself how to kill kittens and highlighted that "I was a lonely boy not having anyone to be there with me […] I was just making those decisions on my own. That's kind of […] my sad story". Therefore, he wanted to enable other people, and in particular his children, the opportunity "to participate in the killing and slaughtering of a sheep". He further emphasised the importance of "having that hands-on experience of the responsibility of being a homo sapiens in this biosphere" and stressed that "I have been enjoying to enable this journey […] and to have a one-day-before conversation and talking about how it's done and why it's done and all those things and as well sharing with them this North American Native story of the dog ceremony […] and how other cultures have been practicing or doing this journey of what is it to kill someone? And what does it make you into? And how can you do that in a good way or in a bad way". In this vein, he explained that he was using this story to transfer his knowledge and to teach the importance of respect towards animals. He also emphasised how "this story in particular, was clearly […] mapping that out in a very beautiful way […] the wisdom of how we, as a community of people, are enabling the young ones to become a part of a community".

When David shared his thoughts about the generation and transfer of his knowledge, he emphasised that he tried to learn "Everything that's related to the field that we find interesting and want to share with other people, as we explore it ourselves". When he referred to his vision of the local landscape, he stressed that "it can be complicated to share a very clear vision, because the vision is always developing over time as we understand more about the place we are in". Further, he mentioned the importance of "building up local resources both theoretical and practical that stay here and expand and get shared with many people over time". In this way, he particularly stressed how he enjoyed to teach and invite other people to his place "to discover what I'm experiencing […] and to have these experiences and get inspired hopefully, […] where you learn about something outside […] and experience it first-hand. So, we kind of offer that and it's feels really positive and good for the most part" (2021).

5 Discussion

This chapter provides an overall interpretation of the major findings presented in the previous section. It discusses the empirical material by focusing on the theoretical framework that has been presented earlier in this research in order to explore how some of the principles within TEK are reflected and mobilised in participants' values and understandings of the natural world. In this way, this section directly addressed the second guiding research question (see section 1.2). Further, the chapter also elaborates upon the common theoretical elements, identified in the literature, from permaculture and regenerative agriculture with TEK but also examines their theoretical differences. The first section commences by concisely summarising the key findings and discusses the meaning of the results. Further, it contextualises the findings with the literature and previous research and theory, and exemplifies their significance for answering the guiding research questions. Following, the implications of this study for the broader scholarly work are discussed. This part epitomises the new insights, explains how the findings correspond to existing knowledge, and highlights what consequences the study's findings contribute for theory and practice. The subsequent part elaborates upon the limitations of this study in reference to the overall research design, specific methodological choices or unanticipated obstacles that emerged during the research process. The last section provides recommendations for other practical implementation and additional research that is needed to further illuminate the human-nature relationships of people practicing alternative farming methods and to explore the potential transformative character of a different understanding of nature for our agricultural system.

5.1 Summary and Interpretation of Key Findings

5.1.1 Responsibility and Interrelationships

The results indicated that all participants shared a similar set of values that highlighted the importance of respect and dignity towards the natural world. Moreover, participants elaborated upon the interrelationships among species and highlighted the connections within their local biophysical environment, as provided in the accounts of David and Gunnar when they explained the various interactions of the elements in their local ecosystem. In this way, participants shared this aspect with TEK that their knowledge was "as much about understanding the dynamics of ecosystems as about the description of their components" (Houde 2007:5). Another similarity between participants values and TEK was found in their understanding that humans and the elements of the natural world are inextricably linked (Deloria 1990; Pierotti & Wildcat 1997). One fundamental insight within TEK was that all things are connected and dependent on each other for their existence (Pierotti & Wildcat 2000). This understanding was explicitly mentioned by Jörgen when he

referred to the impact of his actions for the other elements within his local ecosystem. More, this aspect was also mentioned in the literature concerning the values and principles within permaculture and regenerative agriculture that highlighted the interrelationships between the various species within an ecosystem (Rhodes 2012; Roux-Rosier et al. 2018). Participants also underscored this understanding and highlighted the interdependency between the various elements within an ecosystem, as explicitly mentioned in Sami's account of the "ever-interconnected nature". More, all participants criticised the current disconnection between humans and the natural world and advocated to create more interactions and closer relationships between humans and the various non-human elements. In this regard, Jörgen used the metaphor of an orchestra in order to demonstrate his point that all elements within an ecosystem were collaborating and interdependent from each other and creating a common music. At the same time, he highlighted that humans had to become aware or their role in creating disharmony and had to become more in tune again. However, at the same time he and other participants, such as Peter and Gunnar, explicitly and repeatedly emphasised the special role and responsibility humans had in the functioning of an ecosystem. Although, they highlighted that this included the well-being for all species involved, the findings indicated that most regarded themselves as guardians or stewards of the natural world whose responsibility it was to take care of nature and be responsible for its well-being, as demonstrated for example by Gunnar who asserted that "I see farming as a planetary stewardship thing […] being a kind of management of the planet". This point has been criticised by some practitioners of TEK, who argued that this perspective reflected a Western anthropocentric understanding that stipulated that nature can be subjugated and exists to be governed by humans. Further, participants referred to their practices as managing the landscape, another aspect that was not a traditional idea within TEK (Deloria 1990). Rather, practitioners of TEK argued that every element has the same worth and right to exist independently. Although it cannot be claimed that participants would argue against this point, most did not explicitly share this understanding, except for Peter and David who explicitly asserted that every animal had the right to claim their space.

5.1.1 Living with Nature

Practitioners of TEK stipulated that in order to adequately follow its principles one has to live "with the geography and biology of your environment without trying to alter it solely to meet human needs" (Pierotti & Wildcat 2000:1335). This requires humans to adapt their everyday customs and behaviours in balance with the local ecological and planetary boundaries (Deloria 1992; Anderson 1996). These notions were present in all of the participants accounts and descriptions towards their values and interactions with the natural world. For example, Peter and David stressed the

importance to rearrange and adapt their practices and behaviours with the local ecological circumstances and that every element had a right to claim its space. This aspect was similar to one important element found within the principles of TEK that stipulated that the elements of the natural world have their own reasons for existence and exist independent from human interpretation (Deloria 1992; Anderson 1996; Pierotti & Wildcat 1997, 2000). Yet, other participants also exemplified the notions of living with nature and attempted to peacefully coexist with other species and elements within their local ecosystems. Participants also underlined that their coexistence with nature was not necessarily harmonious, but instead required to make compromises, as elaborated upon by Gunnar when he referred to his interactions with the natural world. All participants also shared a similar understanding of ecosystem dynamics and the interdependencies between the various elements within an ecosystem. They highlighted that humans were an integral part of this system, and hence, needed to be aware of their impact and maintain the ecological balance in order for all other species to thrive as well. This was further demonstrated in the various examples they provided in how they were dealing and interacting with other elements within their local ecosystem. In this regard, David emphasised that they moved into an existing ecosystem, and hence, needed to learn how to exists within it without disturbing the already existing dynamics. He also related to the fox and its attack and highlighted that such an event was part of life. Instead of condemning the action, he respected the foxes will for life and its actions. This was also an aspect identified in the literature on TEK, which mentioned that practitioners identify with predators and their necessity to kill in order to survive (Tanner 1979; Brightman 1993; Marshall 1995).

5.1.2 Representations of the Community

The theoretical section highlighted that practitioners of TEK include other living beings and natural objects in their wider ecological community. They belief that humans and non-humans are closely connected and reciprocally interdependent, and hence, that the activities of one part of that relationship are shaping the lives and ecology of the other (Anderson 1996; Pierotti & Wildcat 2000). Although participants highlighted the reciprocal interdependency between human and other elements in an ecosystem, non-human elements were not explicitly included by most participants in the representation of their community. This represented a significant difference to the understanding within TEK that all parts of the natural world, including animals, plants, and landscapes, are incorporated and extended into the ritual representation of the ecological community (Anderson 1996; Lyver et al. 2019). In this regard, Jörgen admitted that his actions were mainly driven by a human-centred focus and that he attempted to create a better future for his children and subsequent generations. Although this was less explicitly mentioned by the other participants, most also focused on the community of people. Yet, all

participants emphasised the advantages of close communities outside the capitalistic and market-driven perspective and highlighted that they wanted to reconnect and re-establish traditional communities to create more resilience but also rootedness in the local landscapes, cultures, and traditions. Although this aspect was present during all the conversations and observations of the participants, when talking about community, they predominantly understood the concept as mainly be comprised of humans. Peter, for example asserted that "I wouldn't describe nature as community for me […] it wouldn't feel natural to me". However, some participants also acknowledged their wider ecological community including other non-human elements, such as elaborated upon by David and Sami. Yet, it appeared to be rather a more practical understanding than an emotional or spiritual connection between humans, animals, and the landscape. However, all participants emphasised the importance of having a close relationship with the local landscape and attempted to create more connections between people but also the various elements within their local ecosystems.

5.1.3 Nature as Home

During the interviews, participants vividly expressed that they considered nature as a fundamental part in their concept of home. This became especially evident in the accounts provided by Peter and Gunnar, who asserted that the various non-human elements in their local environment felt like a part of them and provided them a feeling of belonging and familiarity. In this way, participants shared the understanding with TEK that non-human elements within nature can be considered in the representation of home. This was surprising, since most participants highlighted that in the representation of their community, elements within the natural world were not necessarily included. However, concerning their understanding of home, all participants emphasised the importance of nature to create a feeling of being connected and at peace that did not necessarily required other humans to be present, but nevertheless was helpful in this regard. In this way, participants connected with the natural elements in a certain spiritual emotional level when it came to their feeling of being at home. Hence, natural elements helped in facilitating a feeling of being at peace and feeling rooted. Also, most participants mentioned that they connected various positive childhood memories with spending time outside, and hence, developed an intimate connection and appreciation for the natural world. This was in particular highlighted by Sami and David, who mentioned that they had spent most time during their childhood outside in nature, which according to David "leaves a very deep sense of appreciation for nature, large deep within yourself".

5.1.4 Generation of Knowledge

All participants shared the importance of local experience and direct systematic observations with practices found within TEK, as explained by Barnhardt and Oscar (2005), Berkes and Turner (2006), Cajete (1994), and Pierotti and Wildcat (2000). Also, similar to the definition of TEK provided by Agrawal (1995), participants highlighted the importance and their commitment to context-specific knowledge and practices, as demonstrated by Gunnar who stressed the importance to find the specific "ecological niche". The findings revealed that ecological knowledge among participants was generated through multiple intertwining pathways. These included field experimentation, first-hand observations, interactions and exchanges with other practitioners, discipline-specific theoretical and scientific research, and local and traditional knowledges, as expressed by Jörgen, Peter and Gunnar. These methods were consistent with practices and methods found within TEK. Participants described these multiple ways of generating knowledge as fundamental to managing and recovering the local ecosystems. Further, they highlighted that their knowledge was based on a comprehensive range of subjective and scientific experiences and practices that were ecosystem and species dependent. Although participants shared similarities in the generation of knowledge to TEK, such as long-term observation and personal experience, the insights were not necessarily explicitly grounded upon a spiritual and cultural relationship to the land and other non-human beings as highlighted within TEK (Kuhn & Duerden 1996; Myers et al. 2005). Yet, some participants were more explicit about their motivations to rediscover local traditional knowledges and the importance of close community relations that transcended human boundaries. This was observed in particular in the exchanges with Sami and David. Similar to TEK, participants highlighted that farming and ecological knowledge was constantly evolving, and hence, required them to closely observe the natural world and modify their behaviour to changing environmental circumstances. This was expressed by David who argued that "I see nature, and even farming as something that is constantly changing and evolving […] and also argued that his vision of the local landscape "is always developing over time as we understand more about the place we are in". This spatial orientation is a fundamental aspect within TEK that pushes practitioners to recognise the abundance of new experiences and evolving ecological and historical circumstances (Deloria 1992; Pierotti & Wildcat 2000). The content of participants knowledge also exemplified various similarities to the conceptual model of TEK, introduced by Berkes (2012). Almost all participants explicitly mentioned the local interspecies dynamics between the various elements within their ecosystems. Further, all highlighted that their approach for the local land and resource management focused on creating benefits for humans and non-humans. This, however, was for most participants not explicitly followed out of a spiritual or emotional connection to the other elements within the ecosystem, but rather out of

the understanding that all elements are interdependent. Hence, participants argued that in order for humans to thrive, the other non-human elements needed to be sustained as well, as explained in the account provided by Jörgen.

5.1.5 Transfer of Knowledge

Participants' knowledge was primarily transferred through written word, interpersonal and informal exchanges including storytelling, more formal training workshops, or personal demonstrations such as inviting other people to the farm or educating others in killing and slaughtering an animal. Practitioners of TEK transfer their knowledge from generation to generation via continuity of practice, oral histories, and interpersonal teachings (Deloria 1992; Barnhardt & Oscar Kawagley 2005; Houde 2007) that are closely integrated with strong ethical and spiritual elements (Murray et al. 2011). This similarity was observed to a certain extent in the accounts provided by Peter and Jörgen who highlighted their motivations to transmit their knowledge to future generations. This was further underlined when Jörgen referred to the dog ceremony and elaborated upon his motivations to provide his children the opportunity to participate in the killing of an animal, which was closely integrated with strong ethical elements. For him, the transfer of knowledge also functioned as a way to create a community and form closer relationships between different generations. Within TEK, the transfer of knowledge is communicated and shared in person on the land instead of relying on theoretical knowledge on paper (Mason et al. 2012). Further, the stories, values, and social relations that are being transferred within TEK are directly contributing to the survival, reproduction, and evolution of Native cultures and identities. Although participants mentioned the importance of transferring their knowledge through the use of inter-generational stories and personal relations, in contrast to TEK the knowledge was not explicitly shared as a means for cultural survival and identity and did not explicitly highlight the restorative benefits and meanings of landscapes as places for cultural and spiritual renewal (Lewis & Sheppard 2005).

5.2 Implications of Study

It is important to underline that this study's findings are highly contextual, drawn from observations and interviews with 5 practitioners of alternative farming methods. Although the specific findings cannot be replicated towards other land use management contexts, I believe that there is great value in the particular perspectives and values presented in this study to research other forms of management of natural resources elsewhere. Moreover, the results of this study agree with previous research on permaculture and regenerative agriculture, concerning practitioners' practices and guiding values. As demonstrated in the accounts of Holmgren (2002) and Mollison (1994), participants relied upon a diverse set of methods and localised experimentations. More, as discussed by

Gosling and Case (2013), participants were guided by a different form of agricultural methods and overall vision, which attempted to re-imagine the human-environmental relationships and to find innovate and more sustainable ways of co-inhabiting their local ecosystems with other natural beings. Also, as indicated by Pickerill (2013), participants attempted to balance the needs of nature with the needs of humans. The recuperation of traditional agro-ecological practices was also another shared element with the existing literature on permaculture and regenerative agriculture. The findings are also in line with previous research that practitioners recognise their responsibility towards the planet and the natural world. In this vein, participants regarded themselves as agents of change that also needed to transcend their interests beyond the human. The literature review and theoretical framework of this research has also demonstrated some of the theoretical similarities between alternative farming methods and TEK. This was evident in the understanding of interspecies dynamics and that all elements within an ecosystem, including human and non-human elements are connected and perform reciprocally interdependent relationships. Although the strong ethical ecological principles of Indigenous peoples have inspired various Western researchers and sustainability thinkers for the sustainable management of natural resources (Ingold 2002; Berkes 2008; Kimmerer 2013; Tree 2018), this study contributes to the existing literature by directly analysing the specific values and practices of practitioners of alternative farming methods in Sweden and comparing them to TEK. In this way, this study is of direct importance to other researchers who want to further investigate the potential commonalities between Indigenous and Western land use practices. Further, this research agrees with various other studies that have recognised the potential transformative power of a more holistic approach that explores the "inner" dimensions of feelings, values, perceptions, and cultural norms and worldviews in addressing the transition towards sustainability, such as demonstrated in the current de-growth literature (Latouche 2009; Kallis 2018), or other studies that have investigated the various initiatives and grass-root movements that are guided by alternative approaches to sustainability (Seyfang & Smith 2007; de Bruin 2016). The results of this study also support the claims made within the embeddedness literature that a high degree of rootedness in the land strengthens ecological beliefs of respect, relationships of reciprocity and caretaking, and feelings of interconnection and interdependence with the natural world (Pierotti & Wildcat 2000; Whiteman & Cooper 2000; Mason et al. 2012; Hoagland 2017). Further, this has also the potential to improve the resilience and well-being of local communities and landscapes (Korsgaard et al. 2015; McKeever et al. 2015; Pinna 2017). Given the multi-layered scale and complexity of climate change, this study agrees that approaching climate change from various dimensions and disciplines can help to think more creatively and to provide innovative alternatives for thinking about the origins as well as the answers to our ecological crisis. This can produce more

ecologically and politically robust solutions by unsettling "the analytical boundaries between society and nature, science and social science, and can provide us with new ways of viewing the world" (Nightingale 2016:46). Such an approach does not necessarily result in a complete understanding of the multi-layered complexity of climate change. However, by approaching climate change, or as in this study agricultural practices, through various ways of conceptualising it, we can reveal new and alternative insights that can help to provide better future solutions for in particular rural communities and a positive transformation of our current food system.

5.3 Limitations of Study

Limitations to this study were inherent in the design and sampling strategy. The purposeful sampling was not statistically representative of a broader population, and hence, findings were highly contextual and did not allow for generalisations. Yet, given the purpose of this study, findings were not intended to be generalised to other land management contexts. However, the study provides an inductively derived, in-depth, and variable understanding of ecological knowledge that may have the potential to further elucidate the character and mobilisation of ecological knowledge in other settings. In this regard, studies that attempt to analyse participants profiles and specific characteristics can help to provide more in-depth and meaningful knowledge. More, the timeframe and scope of this study presented a further limitation. In this regard, a study conducted by various researchers would prove beneficial in two aspects. First, findings could be double-checked and discussed more in detail with peers. Second, the research could provide a more detailed and in-depth account of participants values and principles. The current pandemic also significantly challenged the implementation of the intendent research design and its implementation. Originally, I attempted field visits at all of my participants natural settings. However, as a result of the restricted travel and safety circumstances, this proved to be more difficult. Instead, several online interviews via Zoom were conducted, in which it was still possible to obtain valuable information, but not to observe and participate in the participants' everyday practices. Yet, an advantage of online interviews over real-life settings was the possibility to replay the conversations and focus each time on different aspects, such as body language, postures, intonations, and face expressions. Nevertheless, I was still able to visit three participants in their natural settings and conducted a prolonged field visit at the places of David and Jörgen. Hence, findings from David and Jörgen were more detailed than the rest of the participants. Yet, these challenges did not result in a lack of data, even though this study was constrained in its methodological choices. What can be concluded from this study is that it confirms the existing literature on practitioners of alternative farming methods different set of values and their motivations to promote different forms of

living and community relations. In order to further strengthened this point, future studies with a broader scope and timeframe than this thesis are necessary that can provide a more in-depth account of participants worldviews and values. Another limitation was my own personal background and education within a Western science approach. Being a non-Indigenous, white, and male researcher further solidified this aspect. As a result, there were numerous factors that I was most likely unaware of or did not consider as important within this research that someone with an Indigenous background may have approached differently. Hence, within this study, I could only make assumptions about the principles of TEK, provided from the literature. However, as a result of my personal background, it was even more essential to start creating the foundations for future research that will integrate these two knowledge systems. Ultimately, if integration of knowledge is to be successful, it will be Indigenous researchers who will create the communication bridge between the two worlds.

5.4 Study Recommendations

5.4.1 Suggestions for Academia and further Studies

This study recommends that more practical, hands-on research with greater participation from researchers is necessary in order to further understand and illuminate participants' feelings and emotions. Participating in the everyday practices of the participants proved to be helpful, since this opportunity did not only provide the chance to understand participants values in their everyday practices, but also to experience them as a researcher first-hand. This can enable to conduct more research that is accurately representing participants feelings and can help to understand their particular worldviews and values. On another note, although international recognition of the importance of Indigenous land use practices, and in particular TEK, is growing within the broader scientific community, institutions are relatively reluctant to change (Mason et al. 2012). In this way, obstacles must be overcome in order to further integrate Indigenous land use practices into resource management science curricula and research in order to expand the educational experience and understanding of students and researchers. In this regard, although TEK has been comprehensively studied by anthropologists, it has not been integrated as much into studies provided by natural resource scientists. Also, Western science developed from a certain cultural context of which most students and researchers may be unaware of, but which adherents to different worldviews, such as TEK, may find uncomfortable and perplexing. Most Western research is still relatively distant to its participants. Hence, studies that attempt to build personal relationships that are connected through shared experiences could prove helpful to provide more in-depth and accurate insights into participants worldviews and principles. More, scientific research that would be grounded upon values and practices of Indigenous methods and principles would help to provide a different

set of perspectives, develop more diverse research questions and hypotheses, introduce more sensitive project proposal, and introduce new and innovate implementation strategies. Future research that attempts to combine Indigenous worldviews with Western science would significantly benefit from having a team of researchers that comes from the respective backgrounds and can provide accurate insight information and guide the research design, its process, and its findings in the right direction.

5.4.2 Implications for Policy and Practice

Ever since, Western resource science approaches have dominated academia and policies. Yet, simplifications and utilitarian management methods have proven to be insufficient in addressing the complex environmental challenges, such as climate change, biodiversity loss, mass extinction of species, and unsustainable practices (Chapin et al. 2010). Hence, more holistic approaches and policies are required that are grounded upon a more diverse set of worldviews and that combine various understandings and approaches to science (Berkes & Turner 2006; Trosper 2007; Shrivastava & Kennelly 2013). Combined together, TEK and Western science could provide a resource management approach that develops recommendations for action steps to create new opportunities of cross-cultural problem solving, which is stronger than either can provide alone (Mason et al. 2012; Bussey et al. 2016). In this way, a greater recognition of the values and practices provided by practitioners of alternative farming methods and Indigenous knowledges can have significant positive implications for the promotion of a more equitable, inclusionary, and sustainable food system and overall rural development of many communities. Further, this study argues that particularly in the field of actions, more people are needed that highlight the misconception of the current global food system and capitalistic economic structures in order to significantly address our current climate crisis. It is fundamental in this regard that people interact and re-establish their connection to the natural world by directly participating in the production, distribution, and consumption of local AFNs.

6 Conclusion

The aim of this study was first, to examine the human-nature relationships of practitioners of alternative farming methods in Sweden by analysing their personal values and interactions with the natural world, and second, to explore to what extent participants were replicating and mobilising certain principles of TEK in their local contexts. In this way, the study attempted to analyse how participants were using their knowledge to construct and communicate their relationships towards the natural world. Further, the purpose of this thesis was to provide a starting point to motivate for further research, and in particular action, with regards to the

relationships of humans to nature and a transformation of our current food system. In order to obtain a deeper understanding of participants' specific values and relatedness to nature, the thesis explored their subjective experiences, meanings, and (inter)actions with the natural world. The study's findings affirmed the hypothesis that practitioners of alternative farming methods share certain values and principles found with Traditional Ecological Knowledge. However, significant differences were epitomised in participants understanding of communities and their motivations to perform alternative farming methods. In this regard, most participants affirmed the anthropocentric critic from practitioners of TEK that most non-Indigenous people practicing such a form of land use management, feel responsible for nature and understand the role of humans as managing or stewarding the vitality of ecosystems. Nevertheless, the simple fact that more and more people start questioning the current capitalistic growth paradigm and start to practice alternative farming methods appears to be promising in the regard that it may be possible to re-imagine our connection to nature with the ultimate goal to mitigate climate change and to build a more equitable and sustainable food system. Future research shall further investigate the potential of such movements to positively transform our current systems and help to create a better future for further generations to come.

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8 Appendix – Interview Guide

1. What story would you tell someone about this place?
2. Is this place unique from other areas in your region?
3. What is your understanding behind your way of farming?
4. What are your motivations to perform such a land use management practice?
5. What do you think is the role of humans in the ecosystem?
6. Have you found any inspiration from Indigenous knowledges or land use practices? and if so, which ones?
7. What comes into your mind when you hear the word nature?
8. How would you describe your relationship to nature?
9. How would you describe your relationship and interactions with the non-human world?
10. What do you consider important while interacting with other animals or plants?
11. Have you had any special or memorable experiences with the natural world, and would you like to share this with me?
12. What do you think of when you hear the word community? And what do you consider as being a part of your community here?
13. What comes into your mind when you hear the word home?
14. What are you feeling when you are working on your land?
15. Please tell me about your most valuable experiences on the field
16. What knowledge or insights have you acquired while observing/interacting with plants and animals?
17. How do you acquire knowledge in general? And what have you learnt about the local environment here?
18. How do you disseminate your knowledge? And what is important to you in this regard?